

What Does It Take to Get Out of Drought?

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Colorado State University



<http://ccc.atmos.colostate.edu>

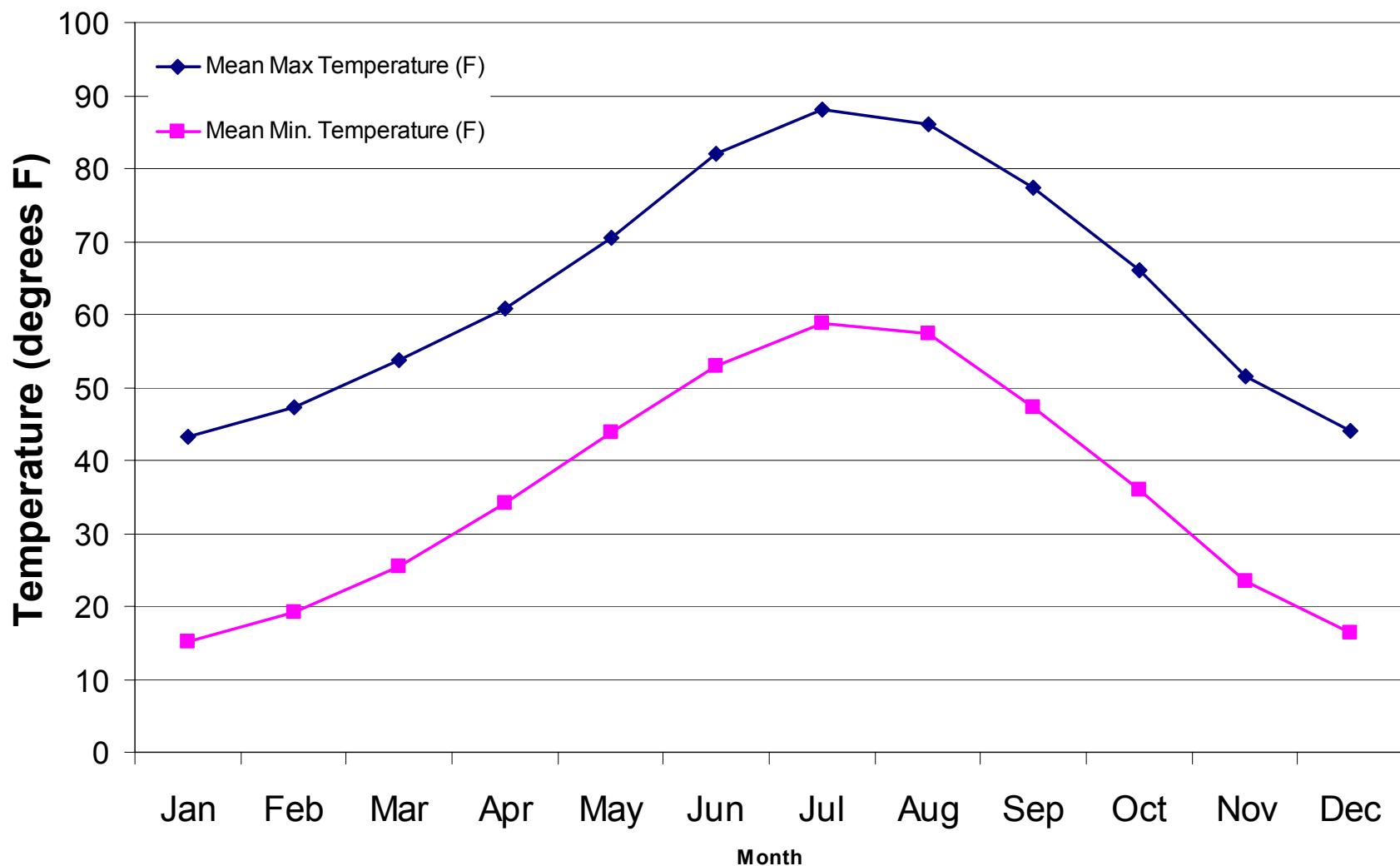
Presented at the Insects, Diseases and Drought Workshop,
May 19, 2004, Centennial, Colorado

Prepared by Odie Bliss

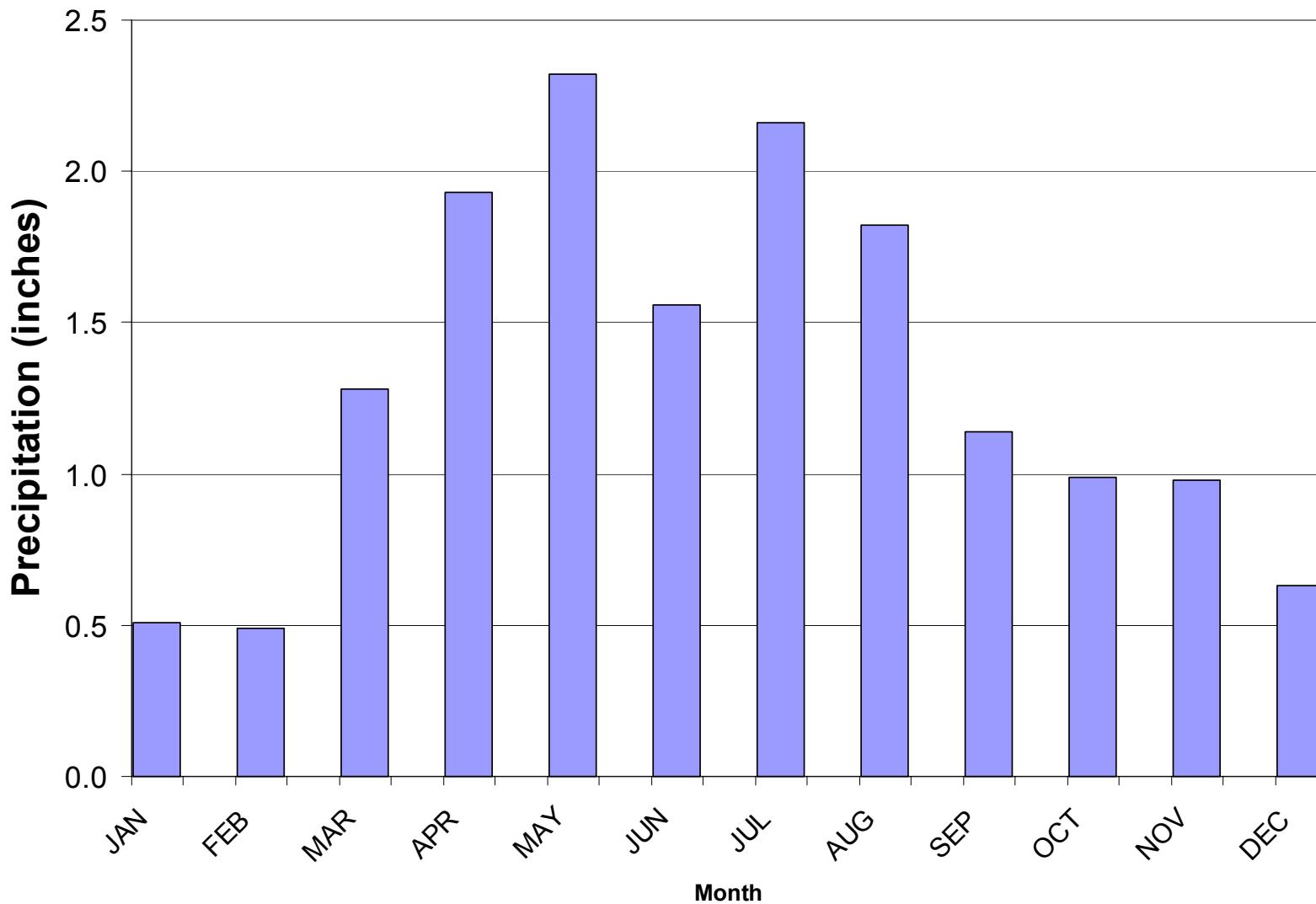
Denver Skyline



Denver Monthly Average Temperatures (1971-2000)

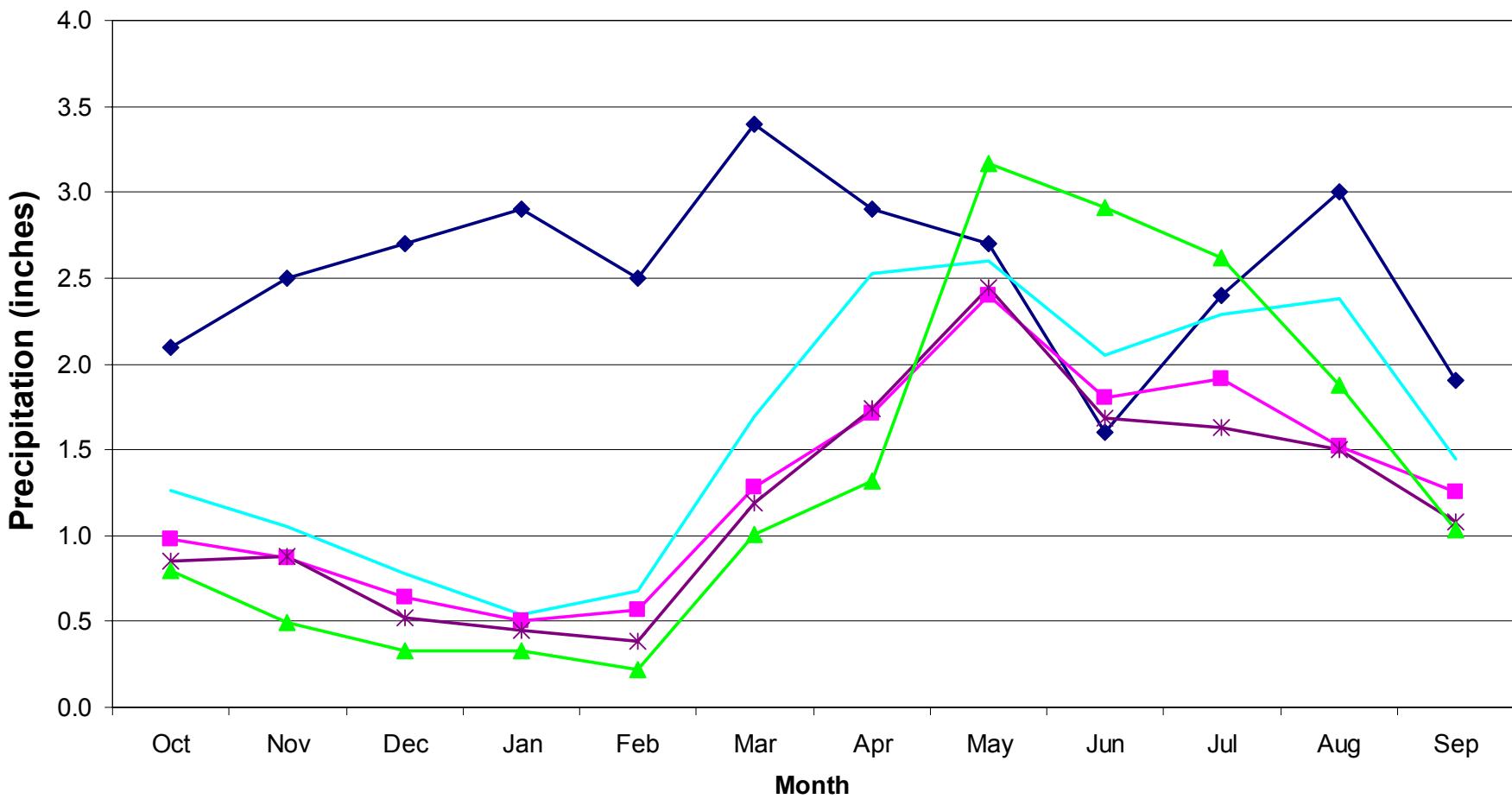


Denver Monthly Average Precipitation (1971-2000 Averages)



Monthly Average Precipitation for Selected Sites in the South Platte Basin

Hoosier Pass Evergreen Denver Stapleton Brighton Sterling



Long-Term Perspective

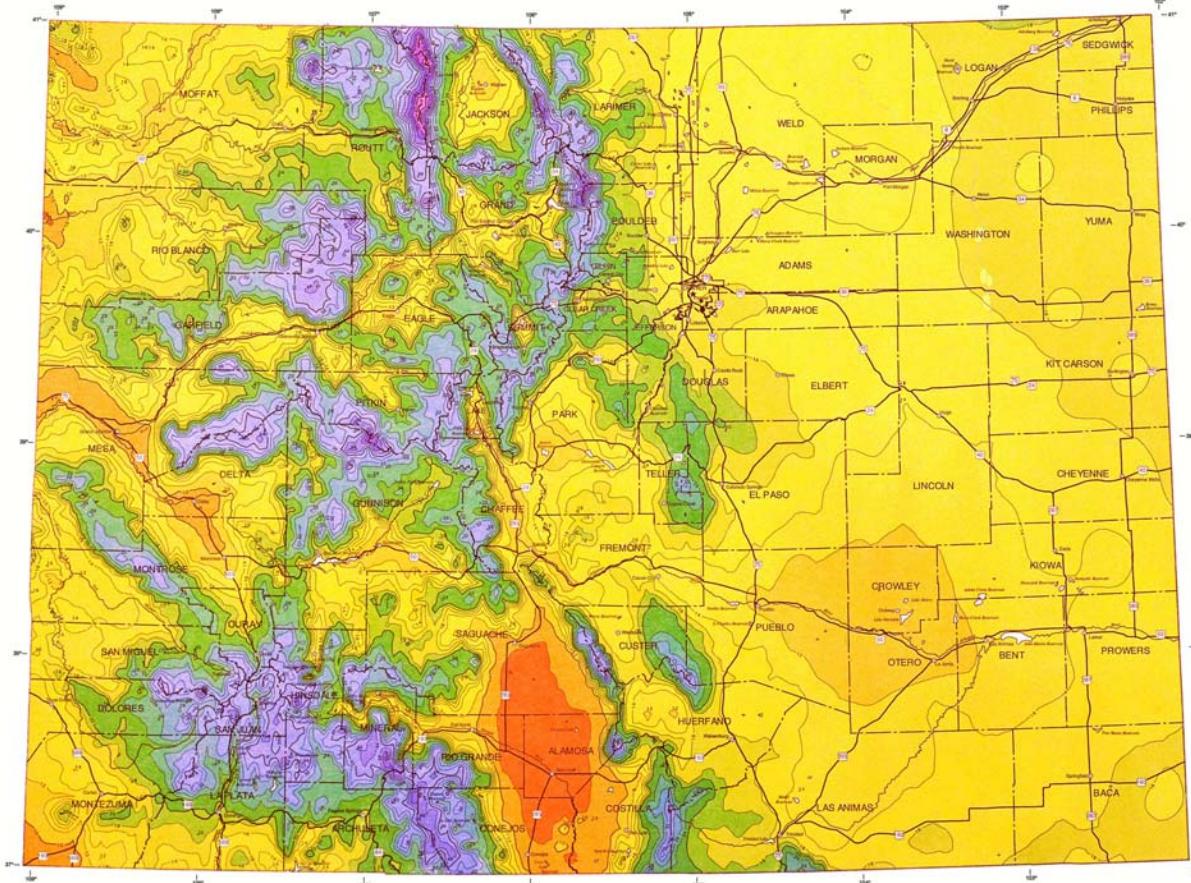


Colorado Average Precipitation

U.S. DEPARTMENT OF AGRICULTURE

NATIONAL RESOURCES CONSERVATION SERVICE

COLORADO ANNUAL PRECIPITATION



Made in cooperation with Oregon State University

Data Sources: National Climatic Data Center (1981-1989 climate observations), NCEP-DOE, Station normals, and precipitation data provided by regional and state hydrologists and drought monitors.

Digital Elevation Model: The PRISM DEM is derived from a 10 arc-second Defense Mapping Agency (DMA) Digital Terrain Elevation Dataset (DTED) derived from the ERSC Data Center.

USDA-NRCS National Cartography & Geospatial Center, Fort Worth, TX, 1988

Estimation Technology: Gridded estimates were derived from station point values using the PRISM model developed at Oregon State University.

The resulting grid was approximately 1 km latitude/longitude and was resampled to 1 km using a Gaussian filter.

Climate Dataset: April 1988 Albers Equal Area Projection, NAD 83/UTM 13N

SCALE 1:1, 185,000

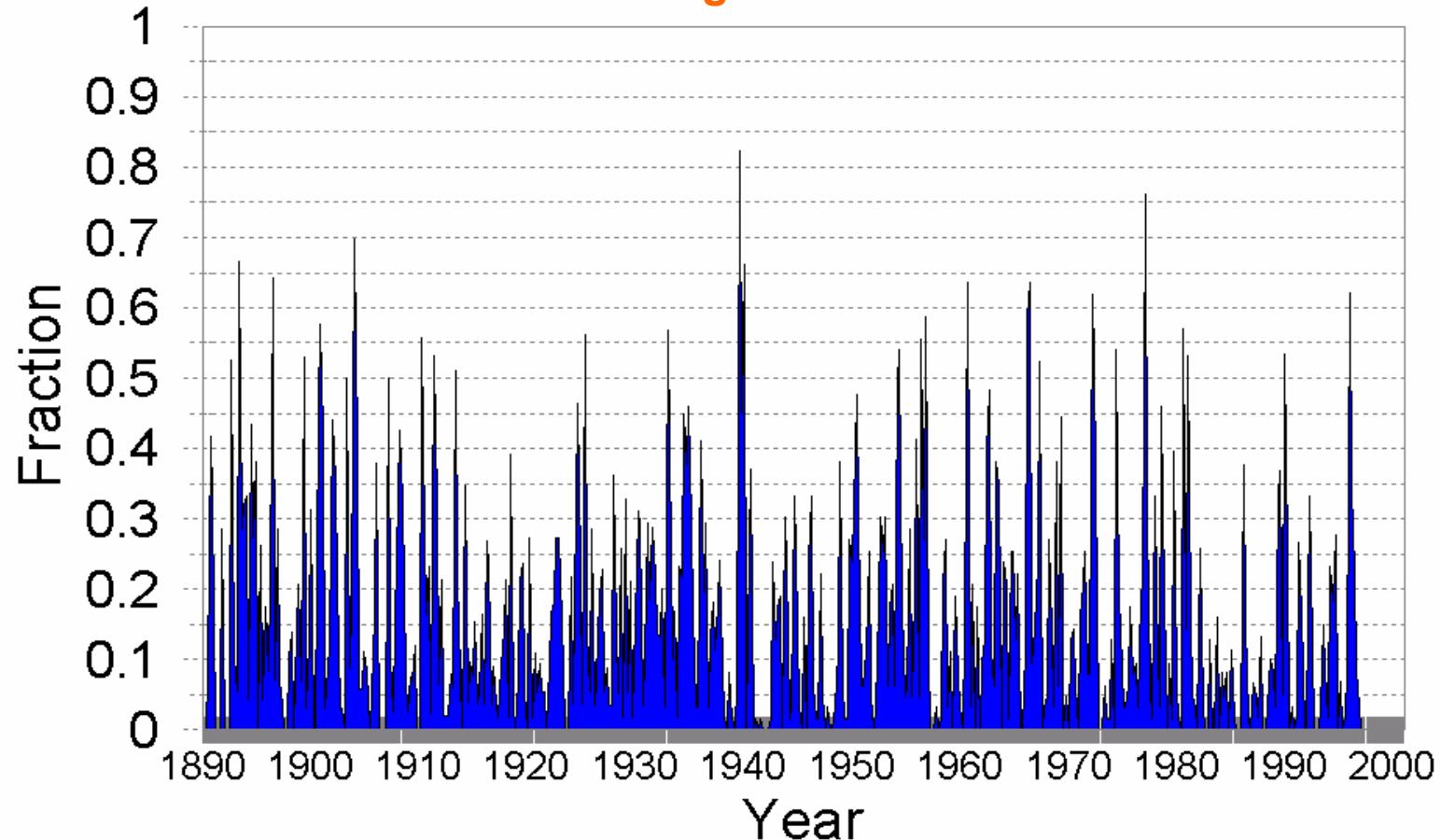
SOURCE NOTE
Users are cautioned that contours may not exactly match station-observed precipitation especially in regions with significant precipitation gradients and/or short-term variability.

April 1988 Version 2

3-Month SPI

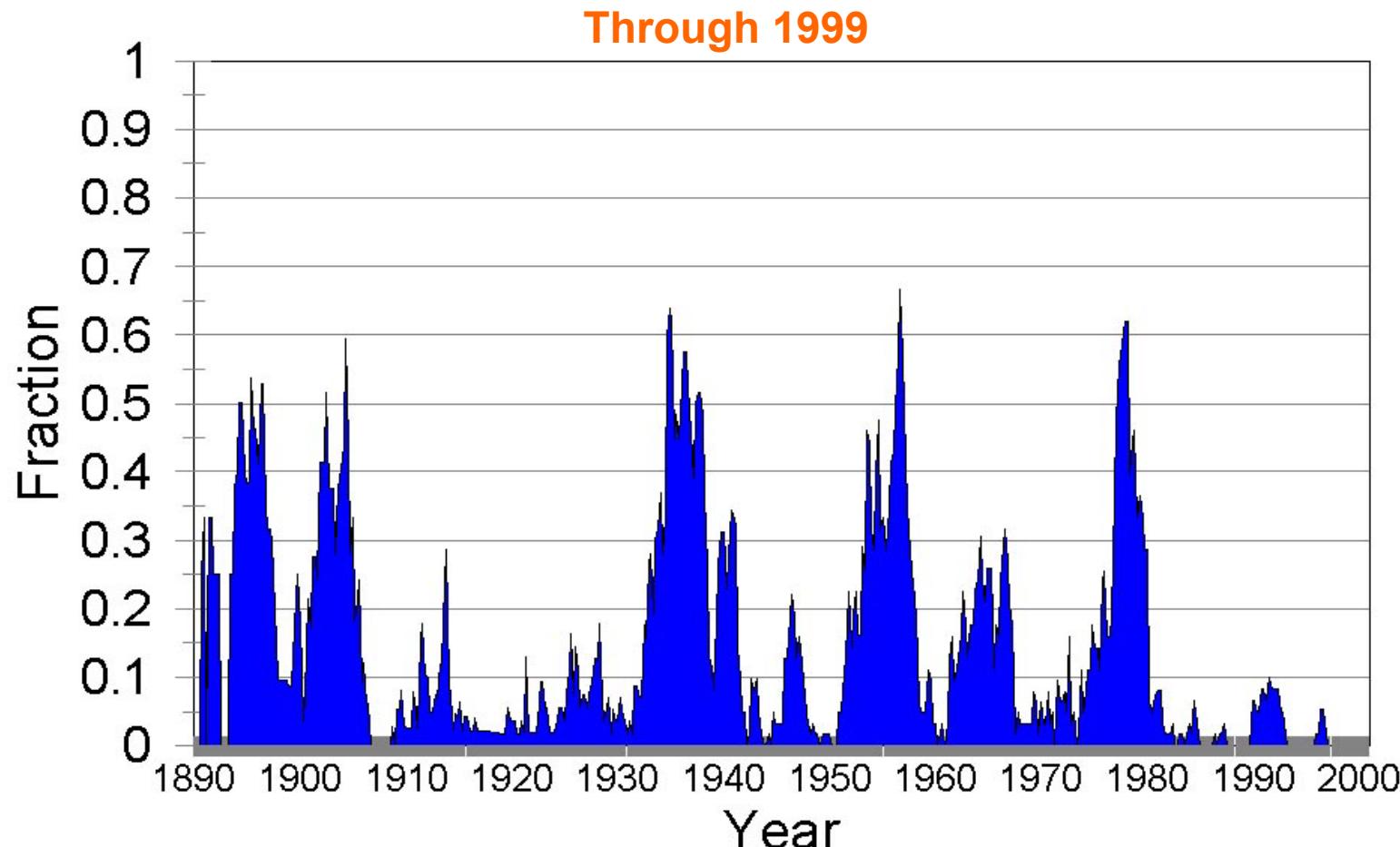
Fraction of Colorado in Drought Based on 3-month SPI

Through 1999

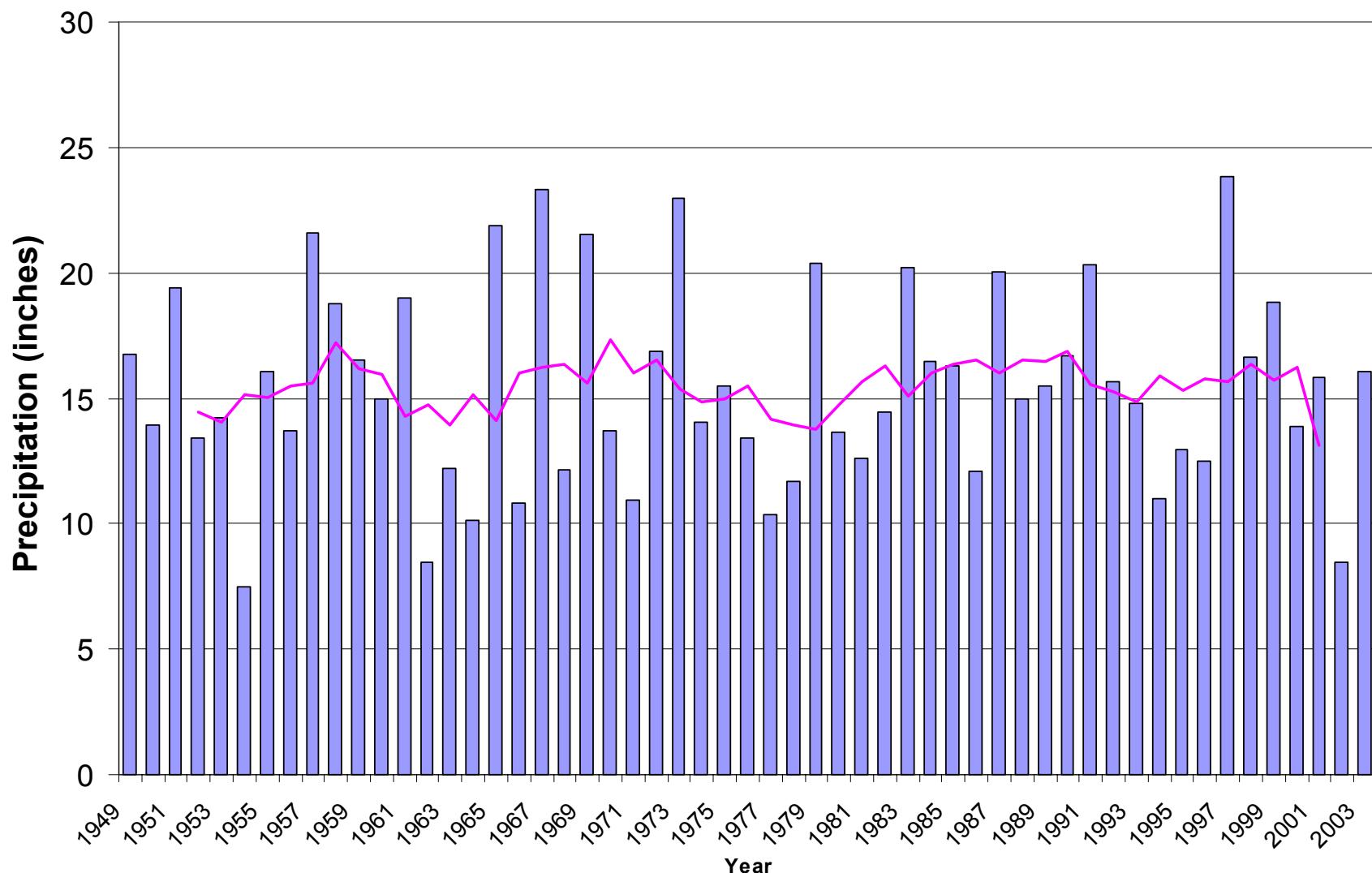


48-Month SPI

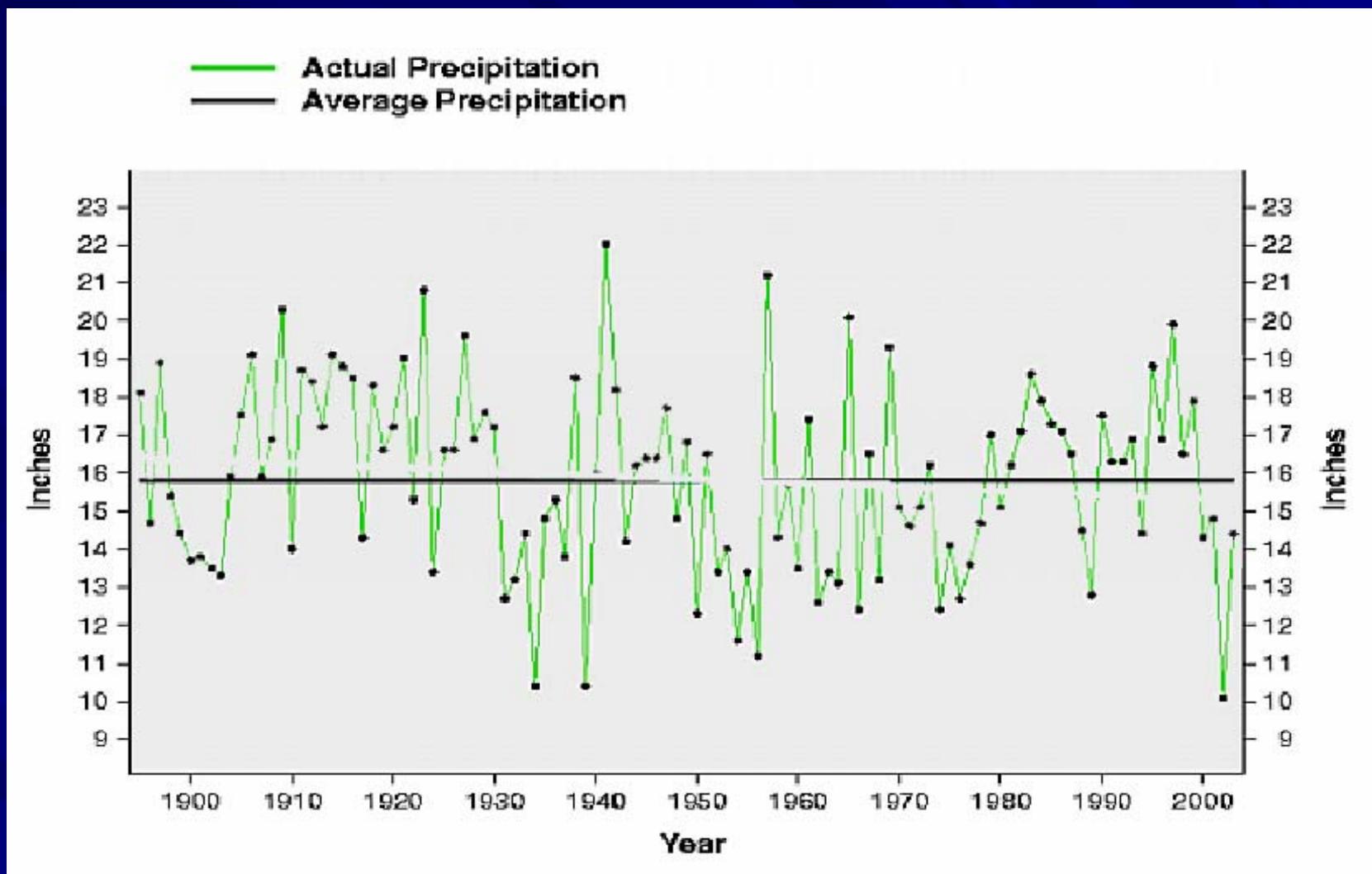
Fraction of Colorado in Drought Based on 48-month SPI



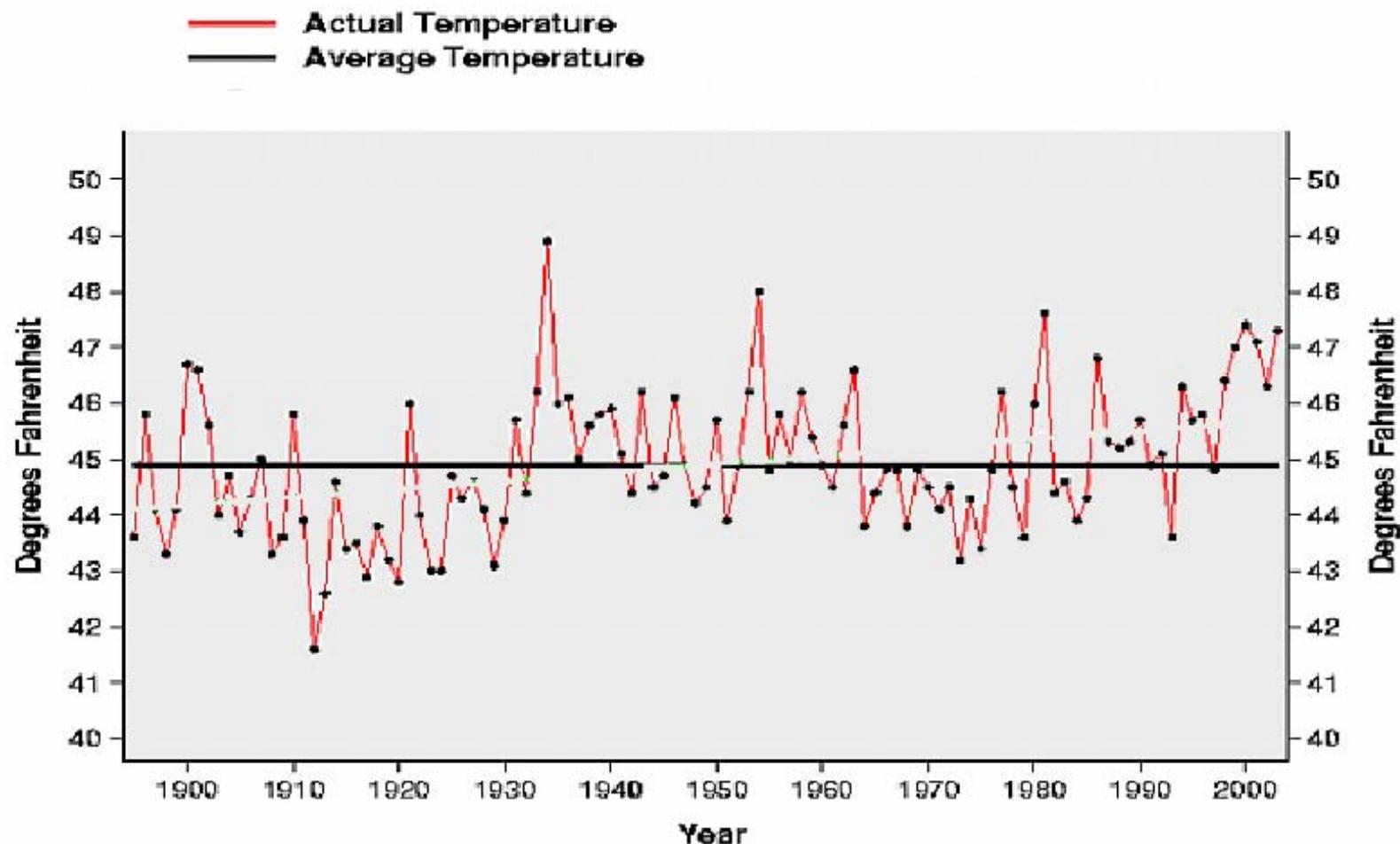
Denver Stapleton Annual Precipitation (1949-2003)



Statewide Annual Precipitation History



Statewide Mean Annual Temperature History

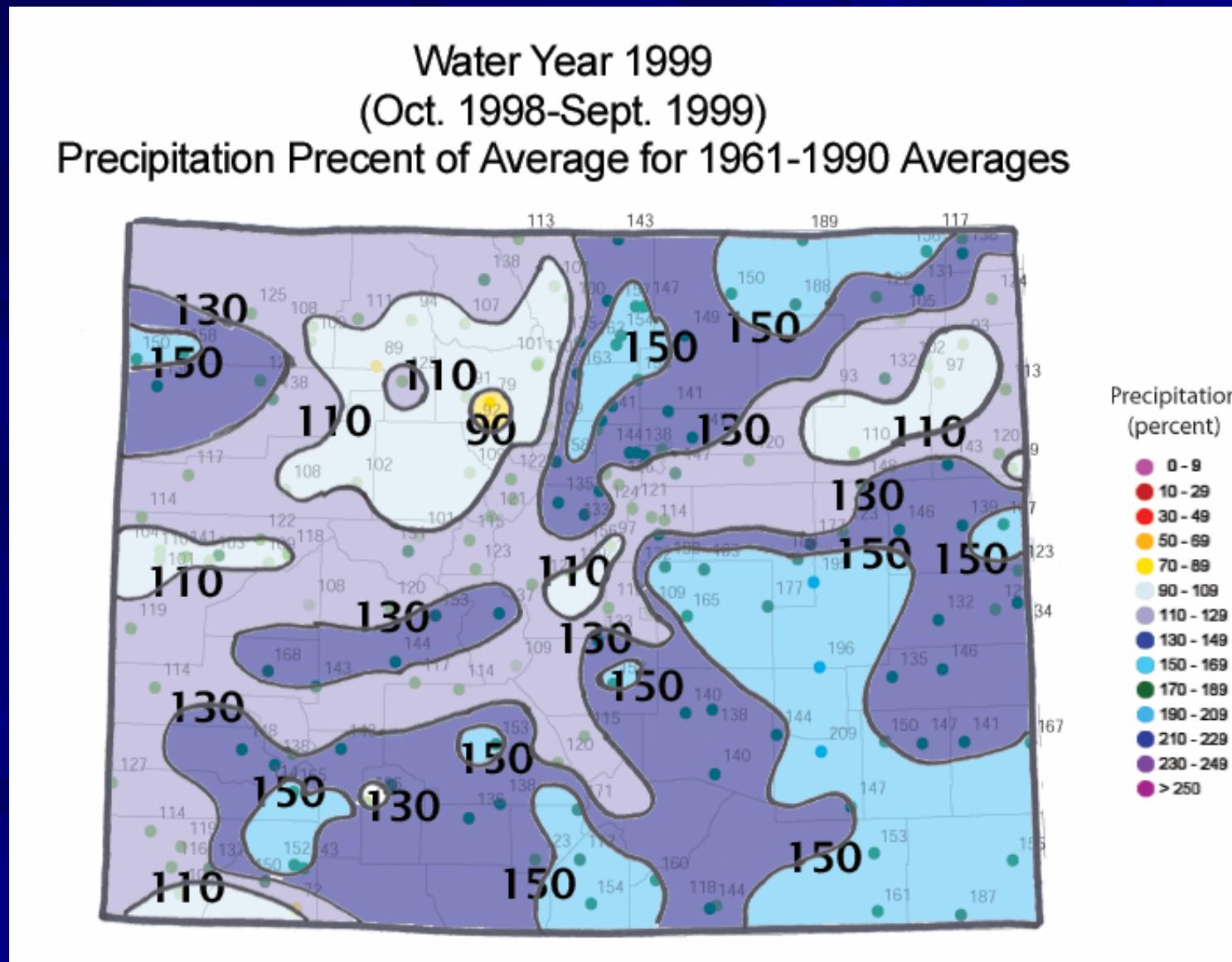


Recent Perspective



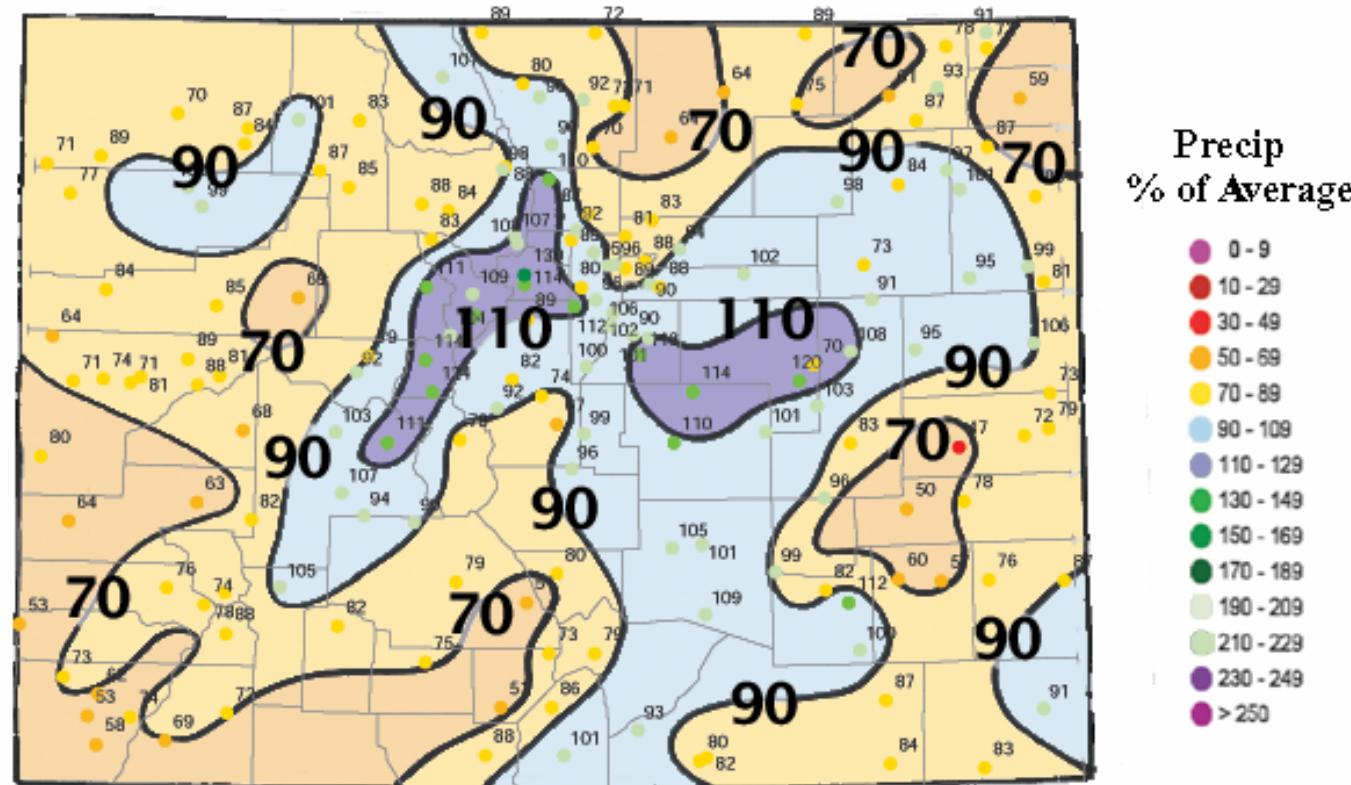
Photo: Barr Lake northeast of Denver, Colorado, October 2002
(Ken Dewey, High Plains Regional Climate Center)

1999 Water Year Precipitation



2000 Water Year Precipitation

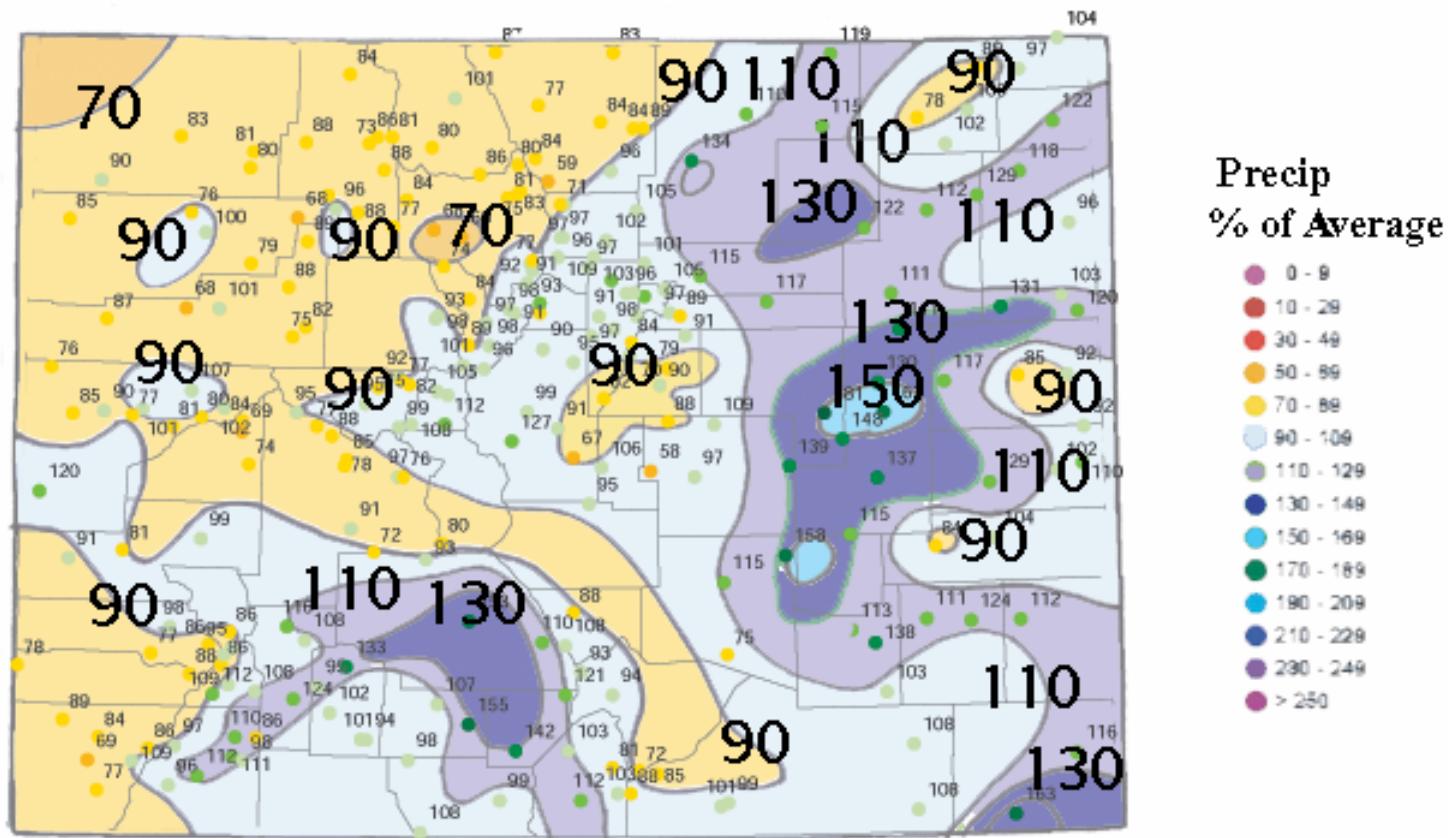
Water Year 2000
(Oct. 1999 - Sept. 2000)
Precipitation Percent of Average for 1961-1990 Averages



2001 Water Year Precipitation

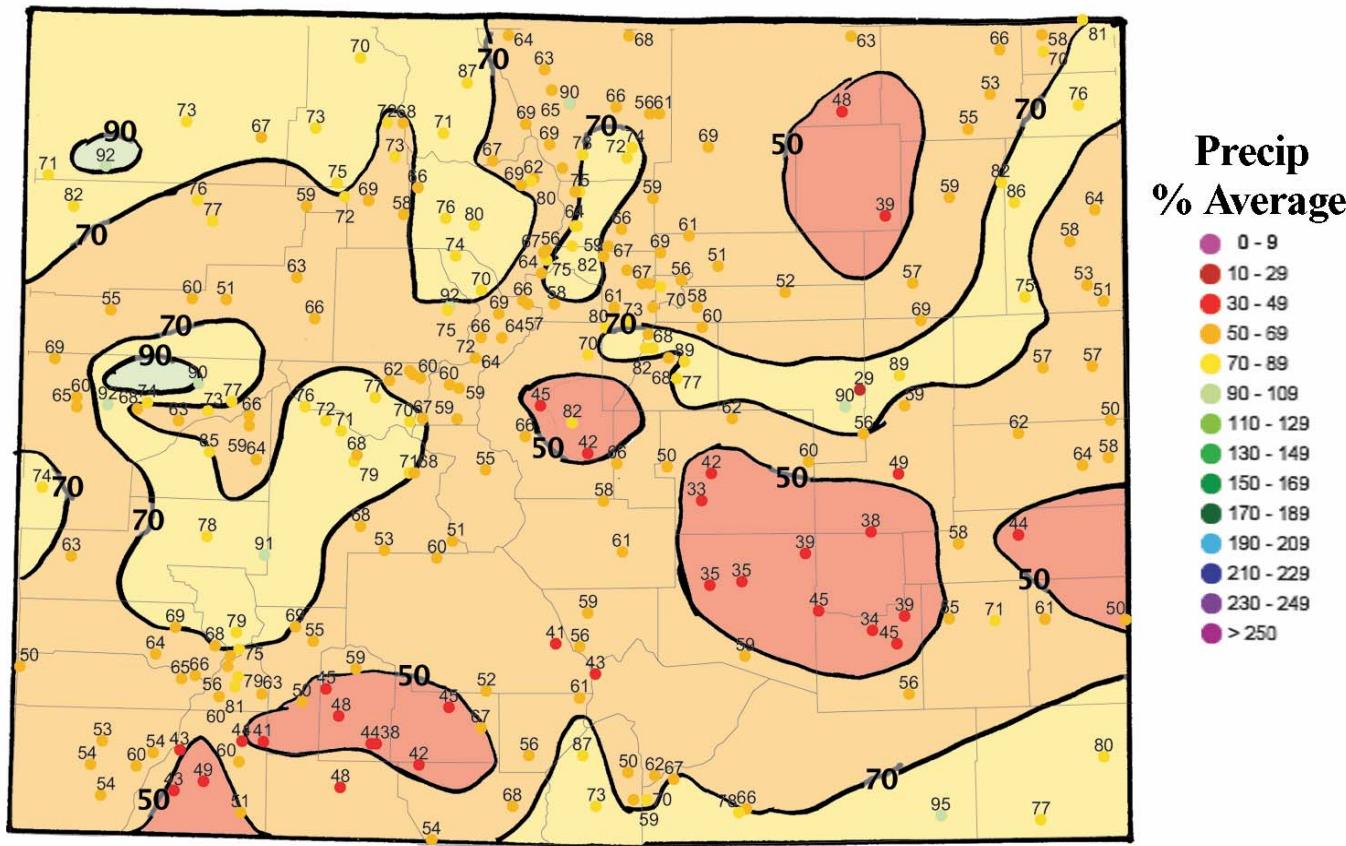
Water Year 2001
(Oct. 2000 - Sept. 2001)

Precipitation Percent of Average for 1961-1990 Averages



2002 Water Year Precipitation

**Water Year 2002
(Oct. 2001 - Sept. 2002)**
Precipitation Percent of Average for 1961-1990 Averages

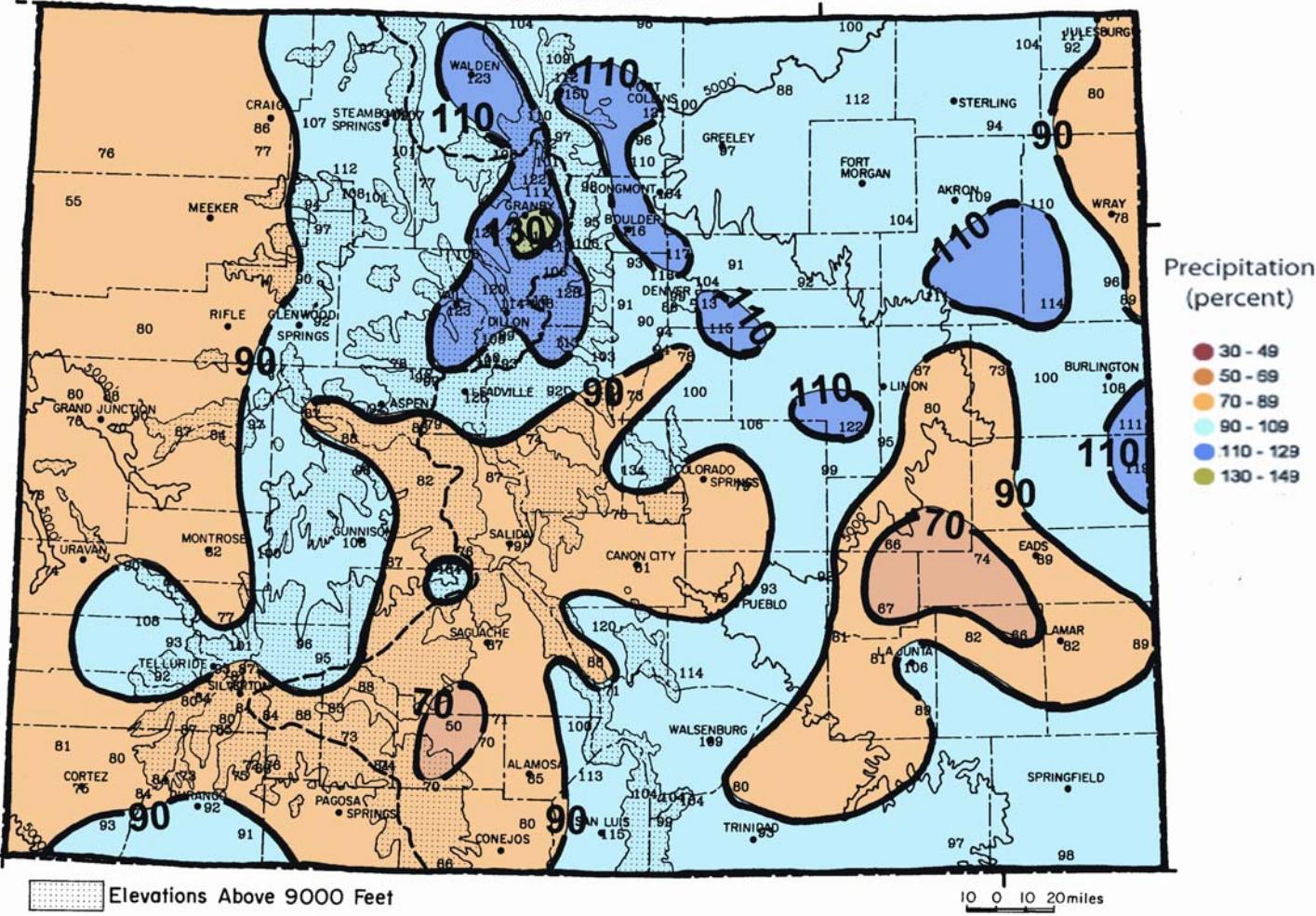


2003 Water Year Precipitation

Water Year 2003

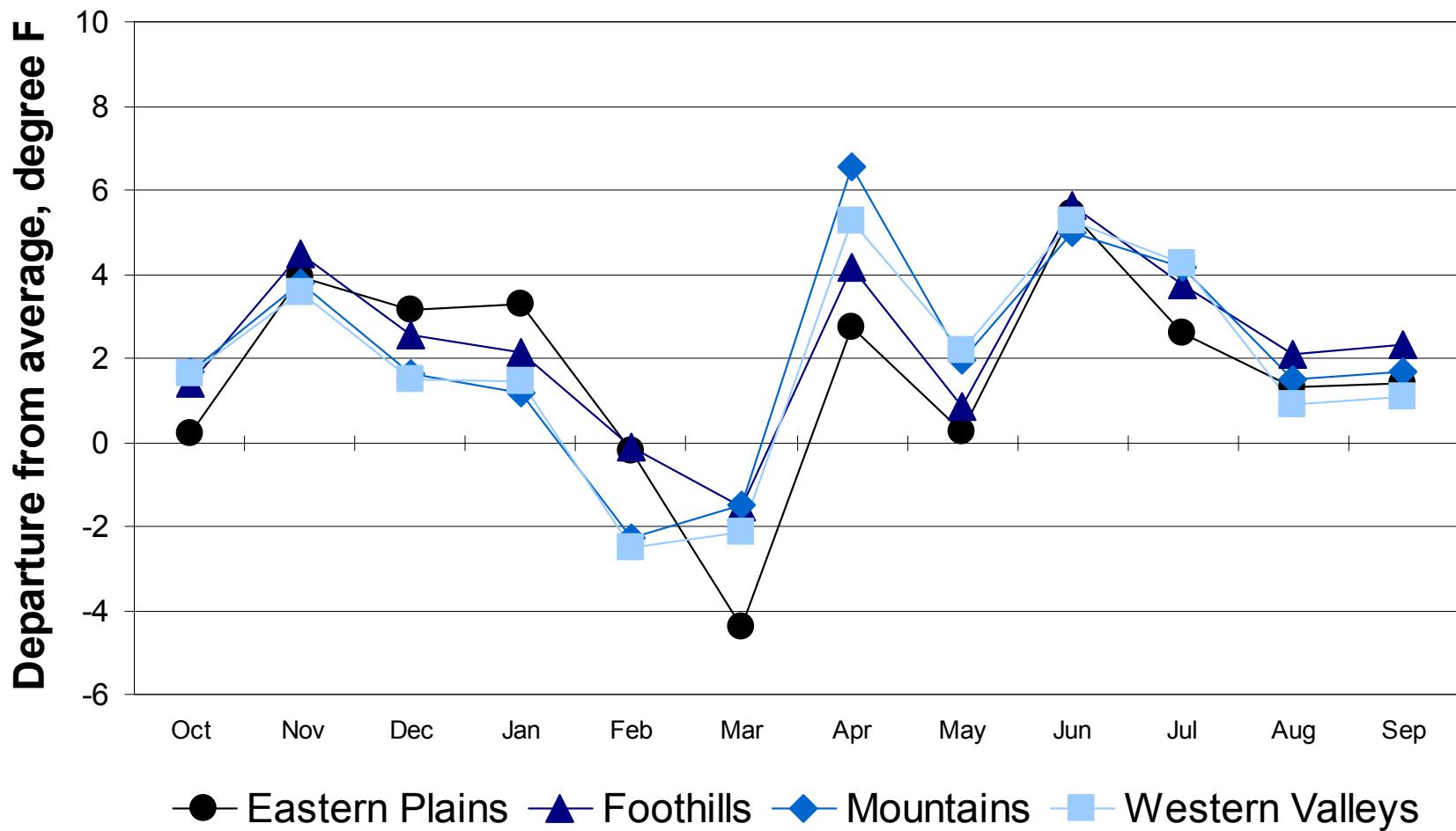
October 2002 - September 2003 precipitation
as a percent of the 1971-2000 average.

COLORADO



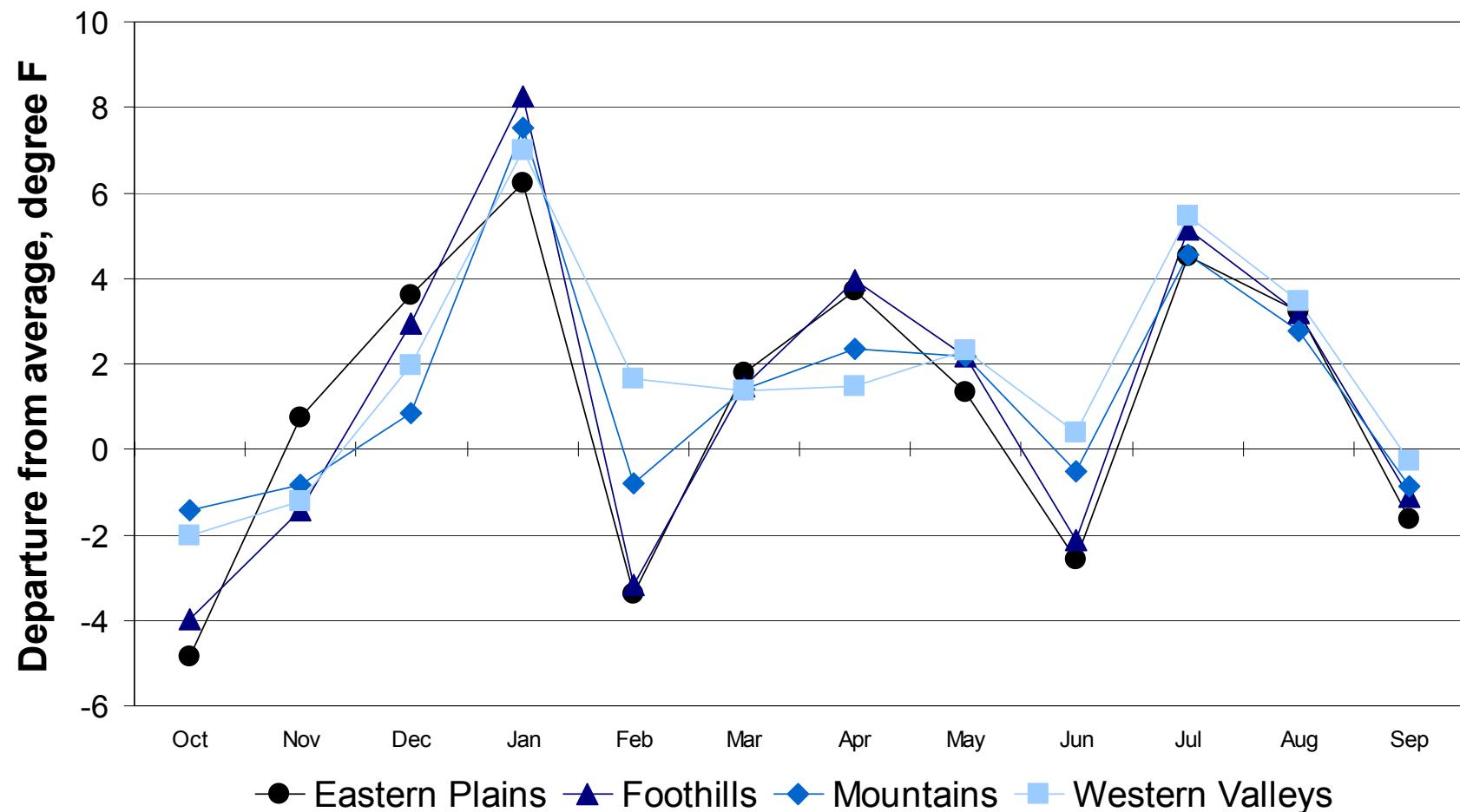
WY2002 Temperature Departures

Water Year 2002



WY2003 Temperature Departures

Water Year 2003



Where We Stand Now

Denver Water Department

SPRING/SUMMER WATERING SCHEDULE

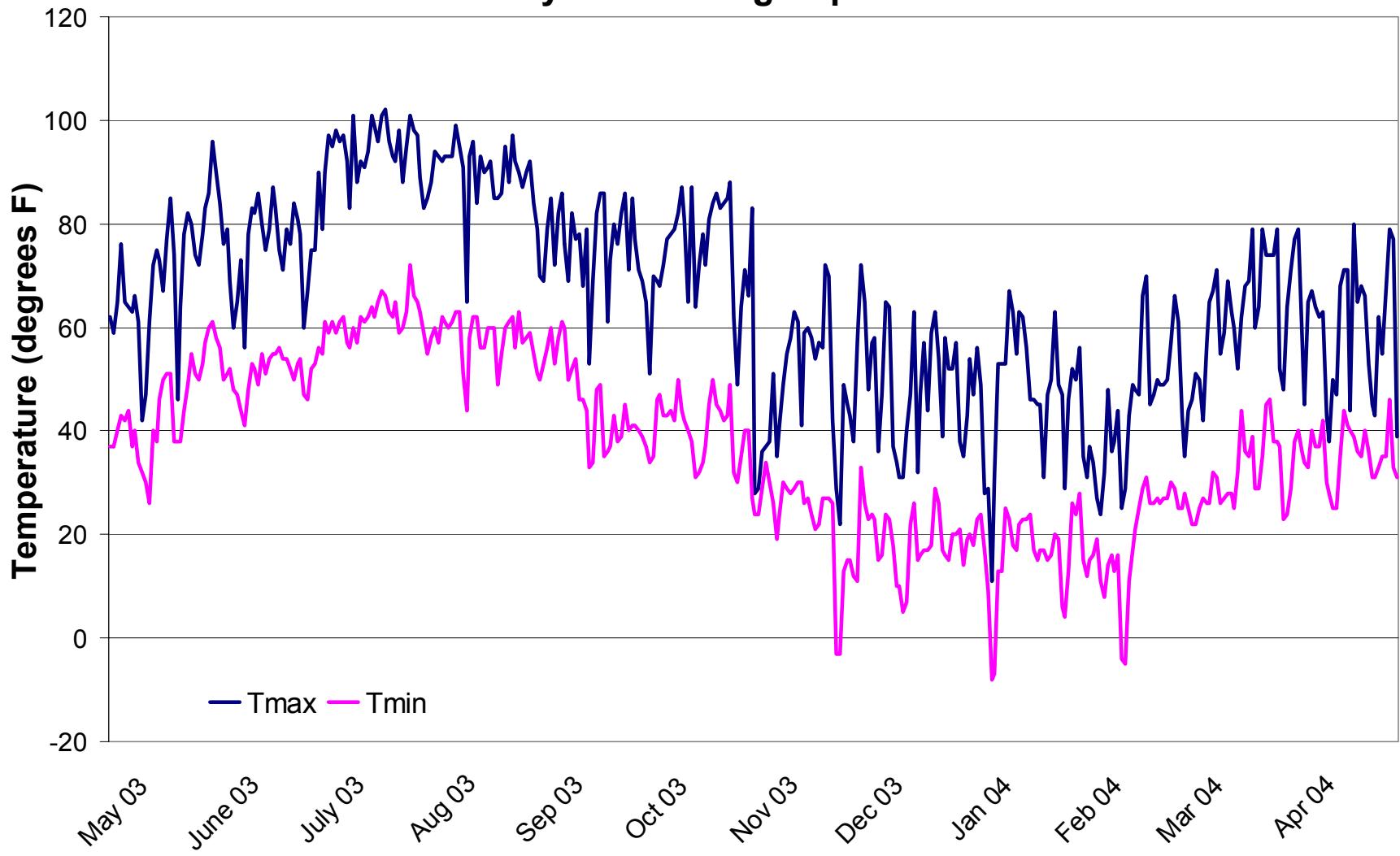
(Effective May 1, 2004)
Watering Schedule

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Even Address Single-Family Residence	NO Watering See exceptions below	- Home Owners Assoc - Apartments - Businesses - Government	Odd Address Single-Family Residence	Even Address Single-Family Residence	- Home Owners Assoc - Apartments - Businesses - Government	Odd Address Single-Family Residence

2004 Spring/Summer Water Use Rules

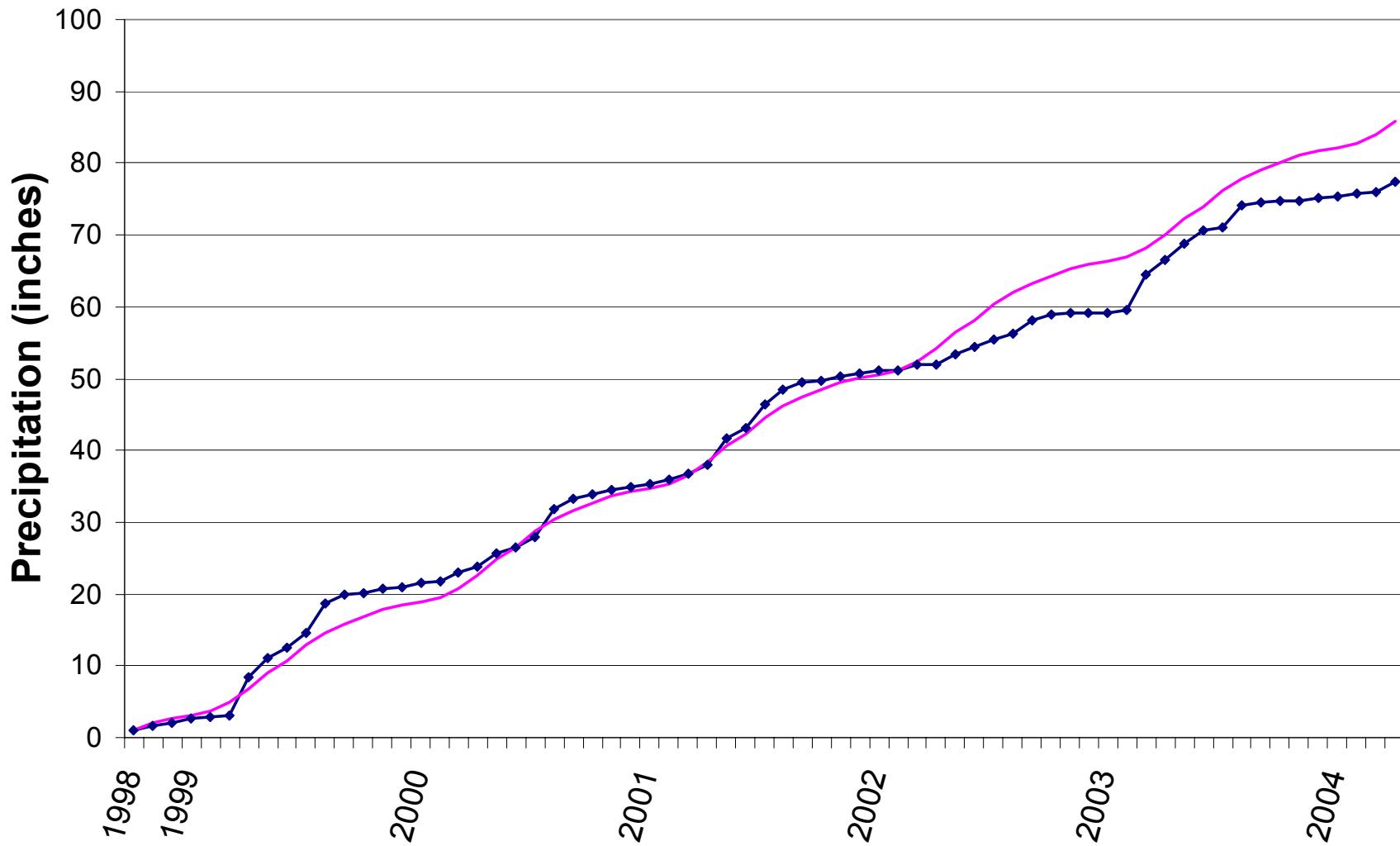
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<i>Single Family Residences</i>							
Odd numbered addresses		🚫				💧	💧
Even numbered addresses			🚫			💧	💧
<i>Businesses, Government, Home Owner Associations & Apartments</i>				🚫		💧	💧

Daily Temperatures for Denver Stapleton for May 2003 through April 2004



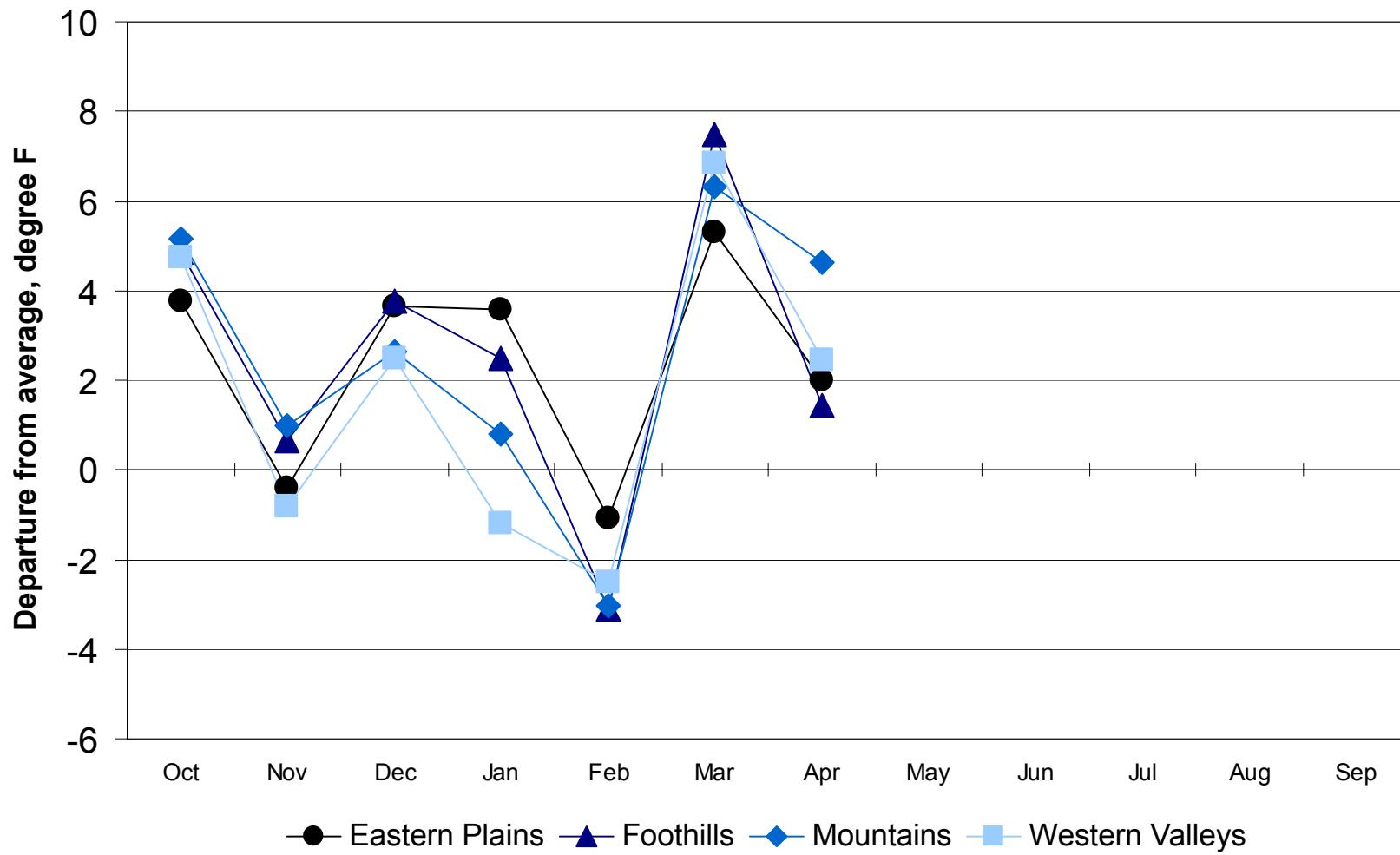
Denver Monthly Accumulated Precipitation for October 1998 through April 2004

Monthly Precip Accum — Average Precip (1971-2000)

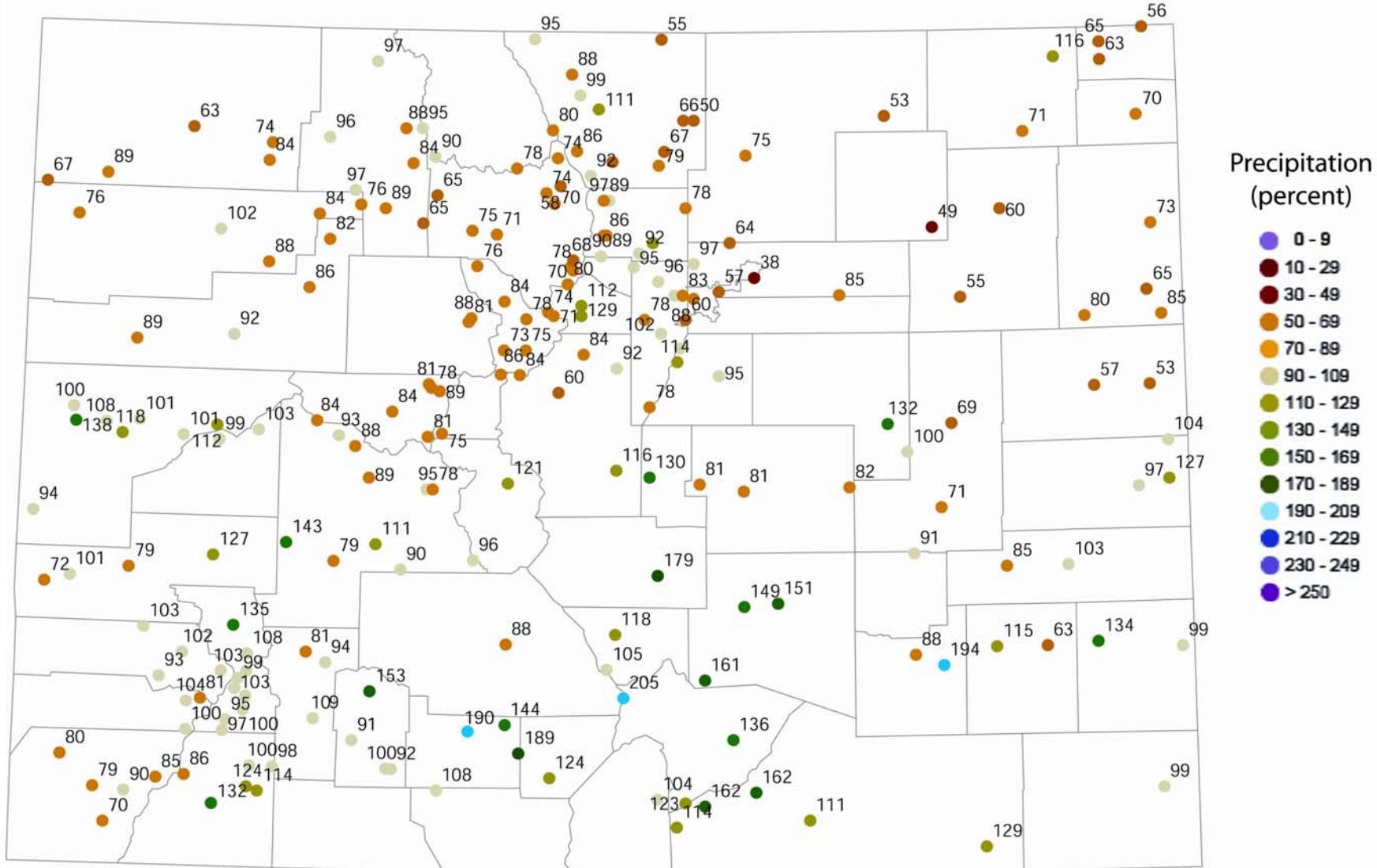


WY2004 Temperature Departures

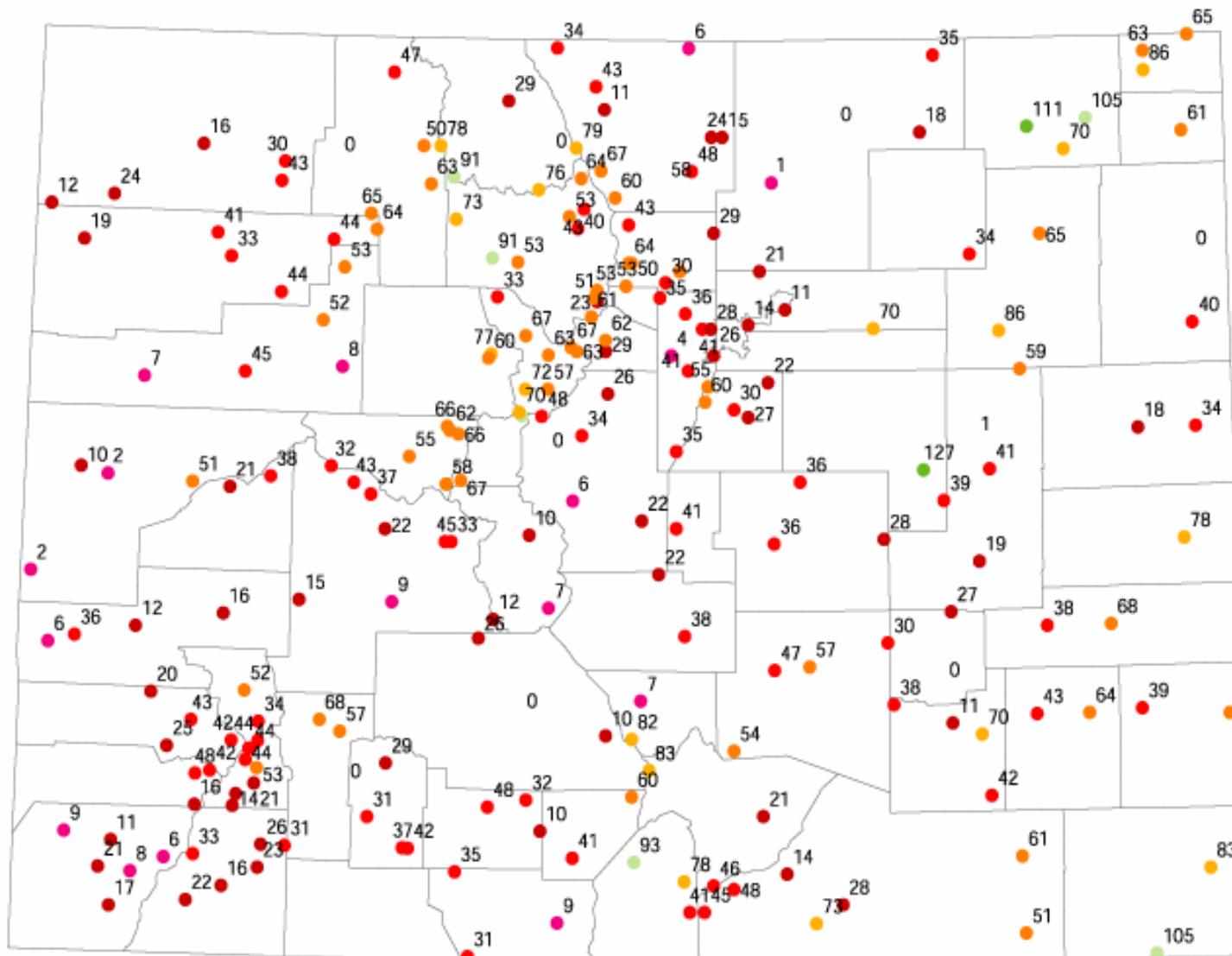
Water Year 2004



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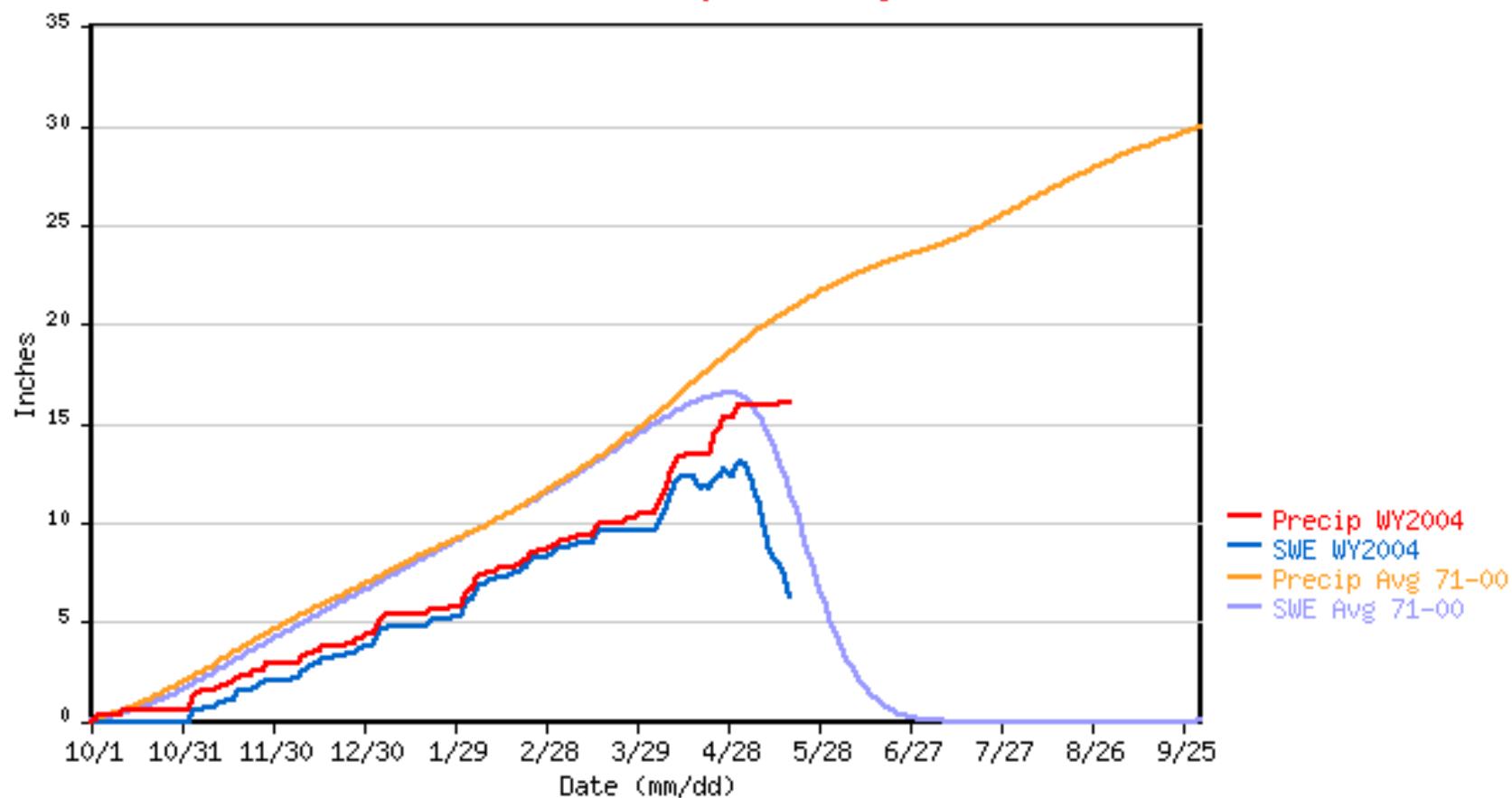


March 2004 precipitation as a percent of the 1971-2000 average.

Hoosier Pass

HOOSIER PASS SNOTEL for Water Year 2004

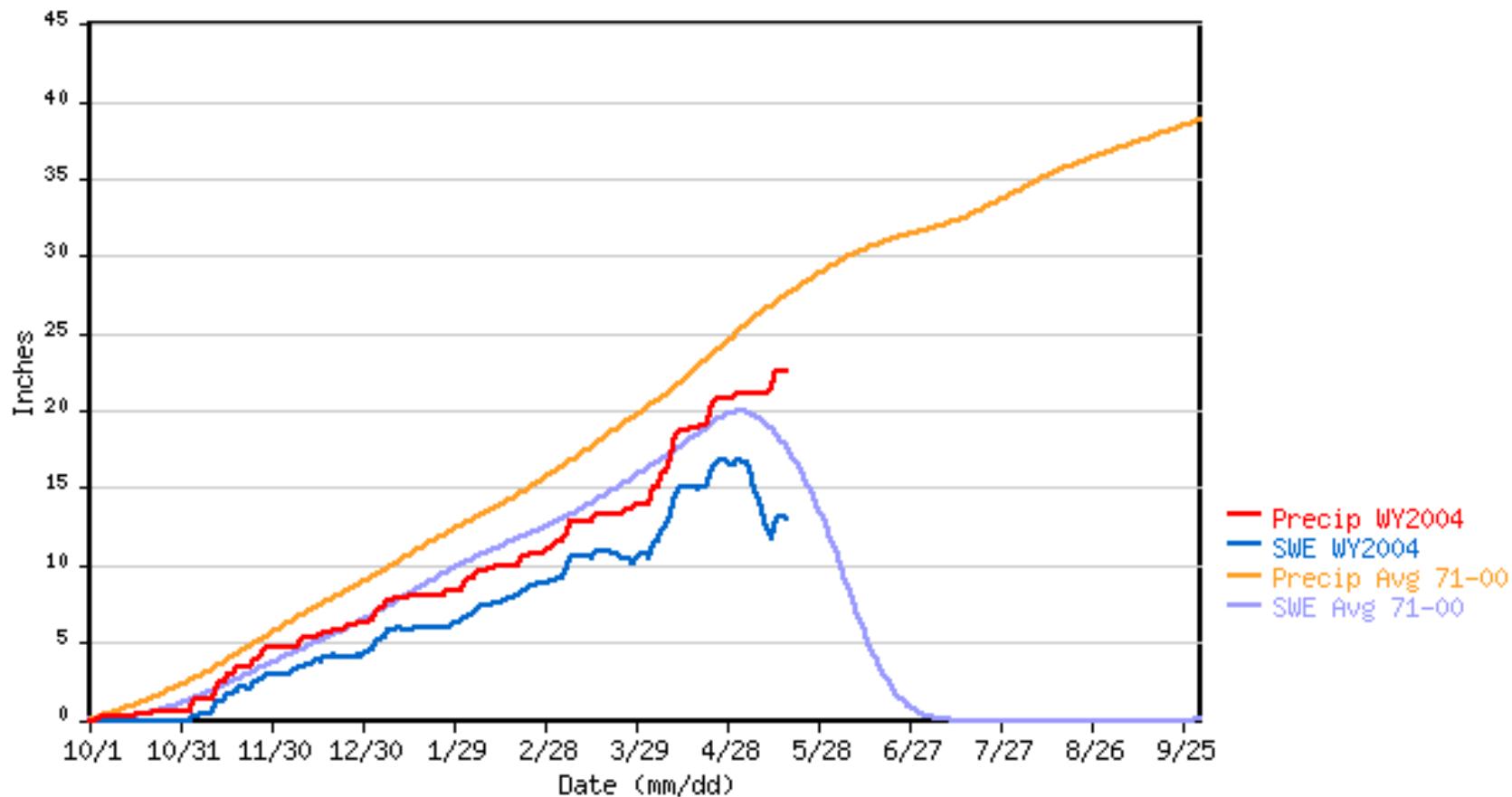
*** Provisional Data, Subject to Change ***



University Camp

UNIVERSITY CAMP SNOTEL for Water Year 2004

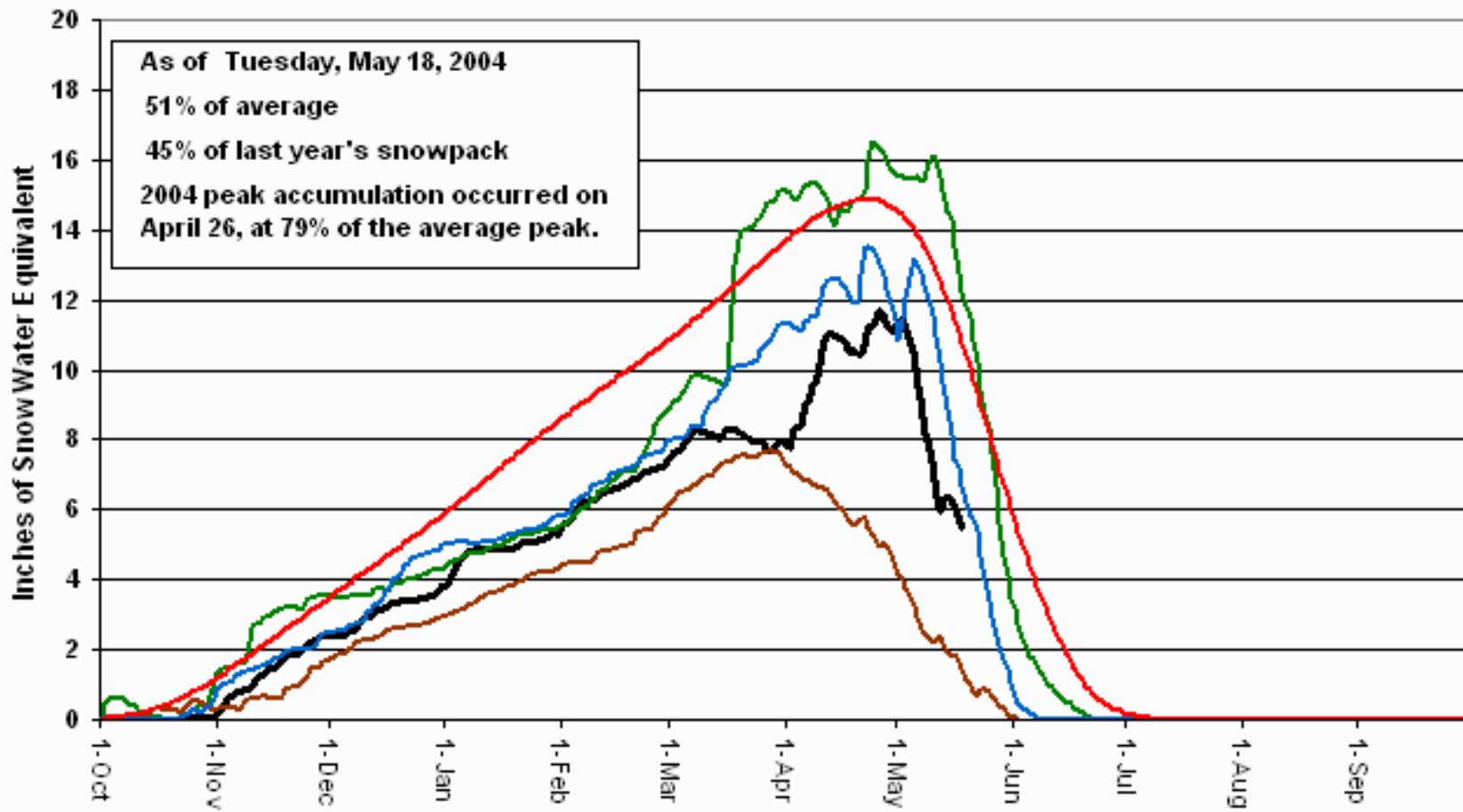
*** Provisional Data, Subject to Change ***



South Platte Basin Snowpack

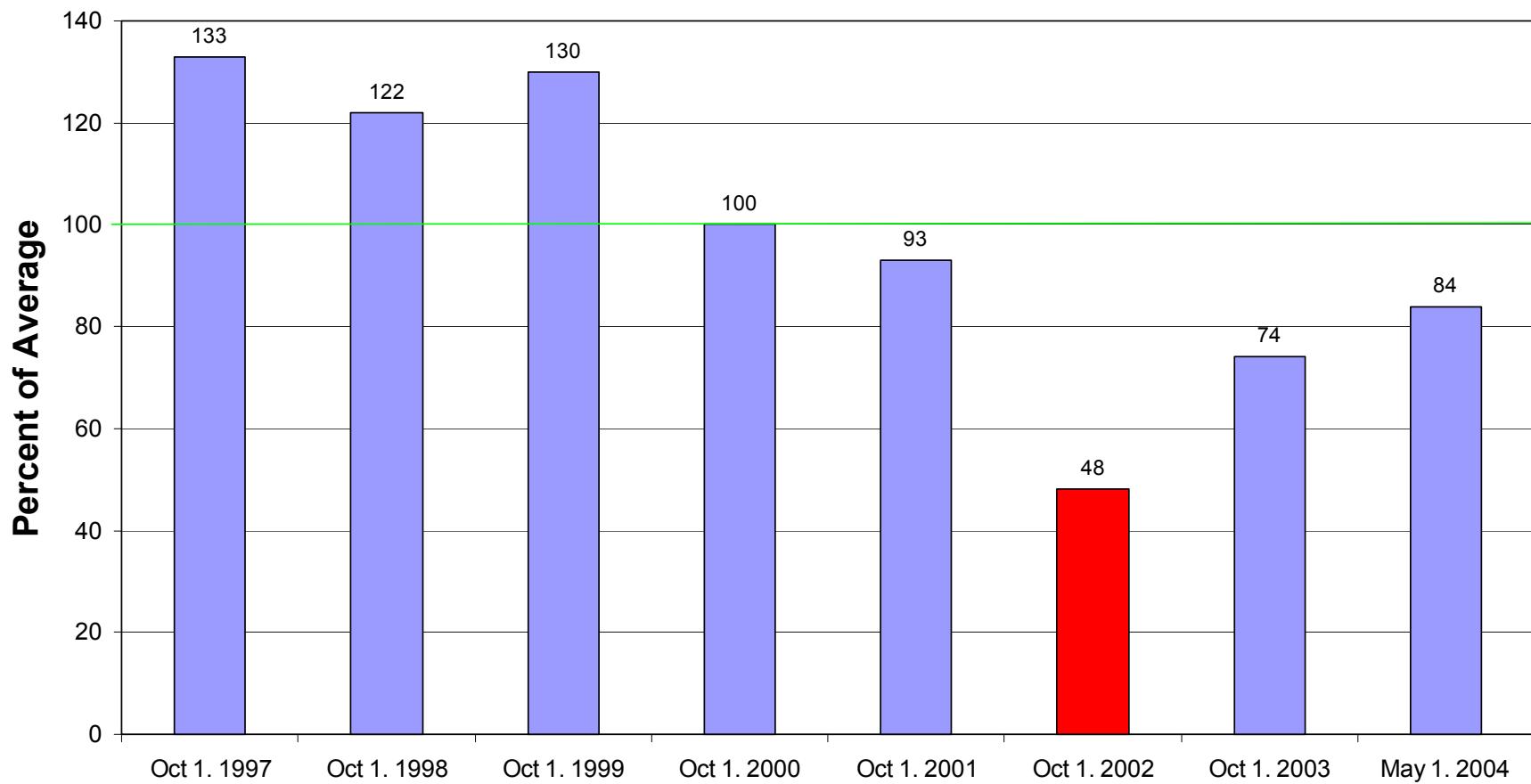
Based on provisional SNOTEL data.

— 2004 — 2003 — 2002 — 2001 — Average



Reservoir Levels

**Colorado Statewide Reservoir Levels on October 1st
for Years 1997-2003 and May 1, 2004**



What Comes Next?



Positive Indicators

- Late winter snows
- Cool spring
- Multi-day precipitation
- Wet Snow
- Low intensity rainfall
- Light winds
- High humidity
- Abundant cloud cover

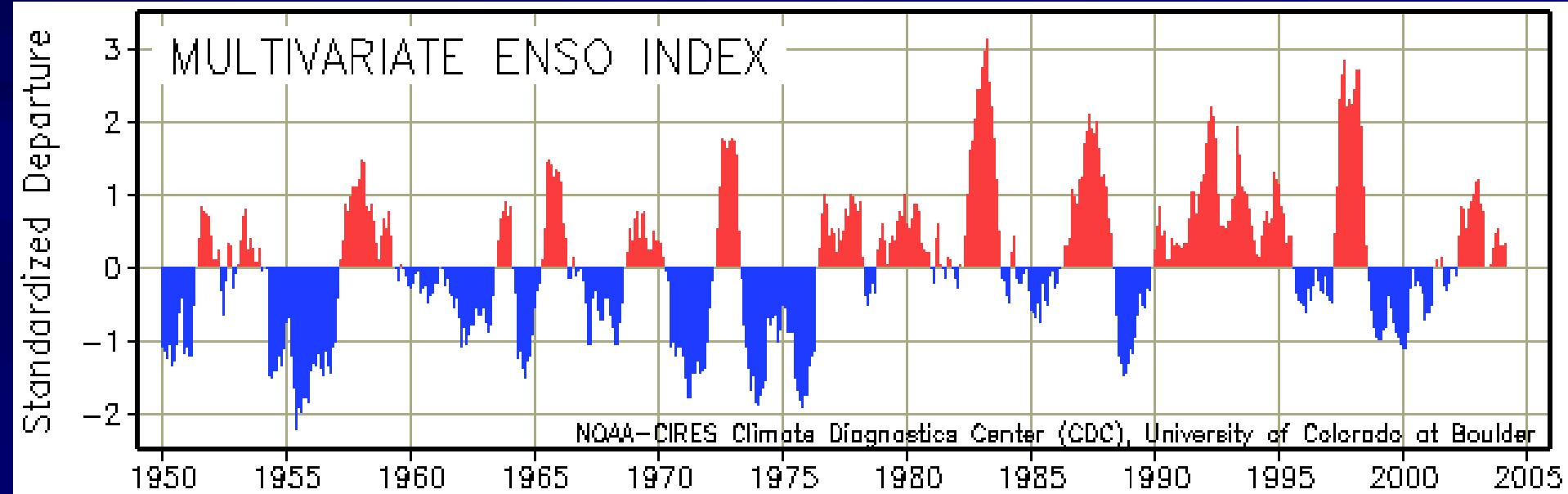


Negative Indicators



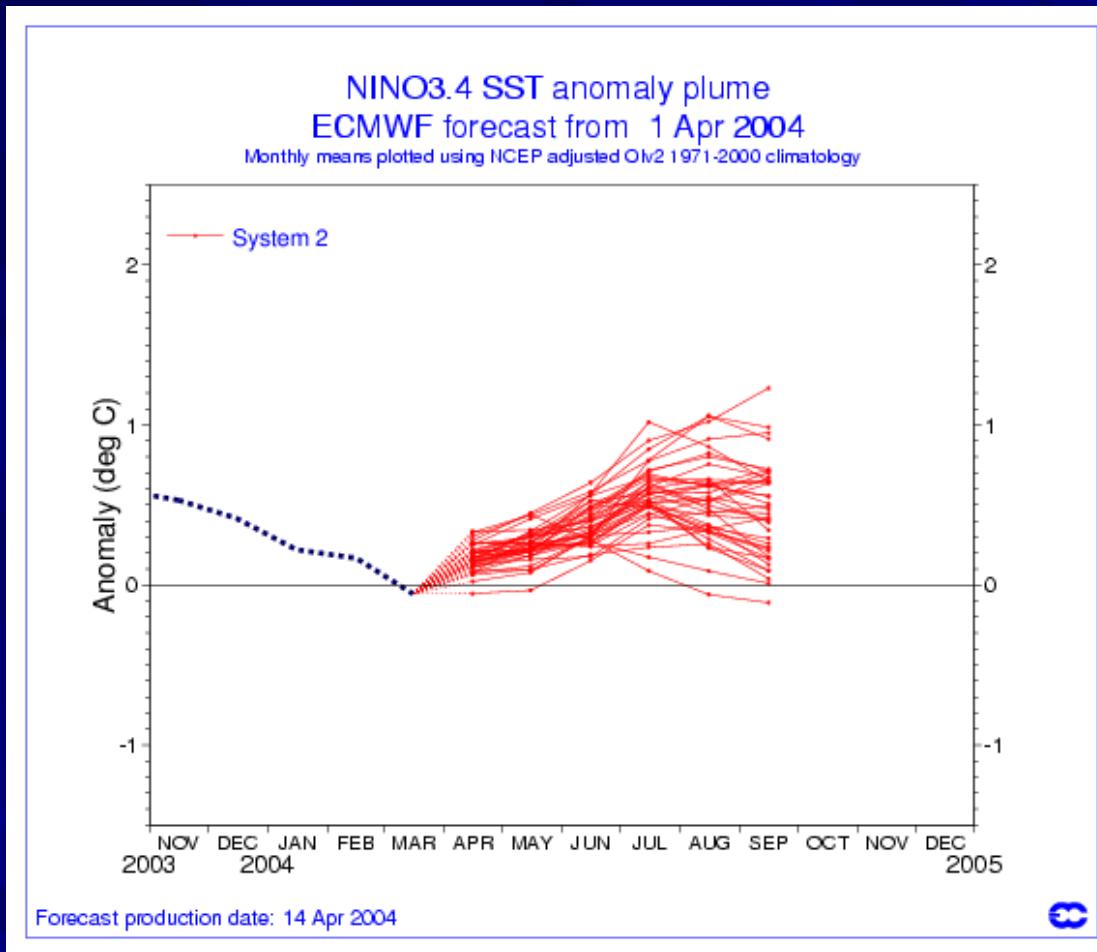
- Little late winter snow
- Missed opportunities
- Warm spring
- Brief, sporadic precipitation
- High intensity rainfall
- Frequent, strong winds
- Low humidity
- Abundant sunshine

Multivariate ENSO Index (MEI)



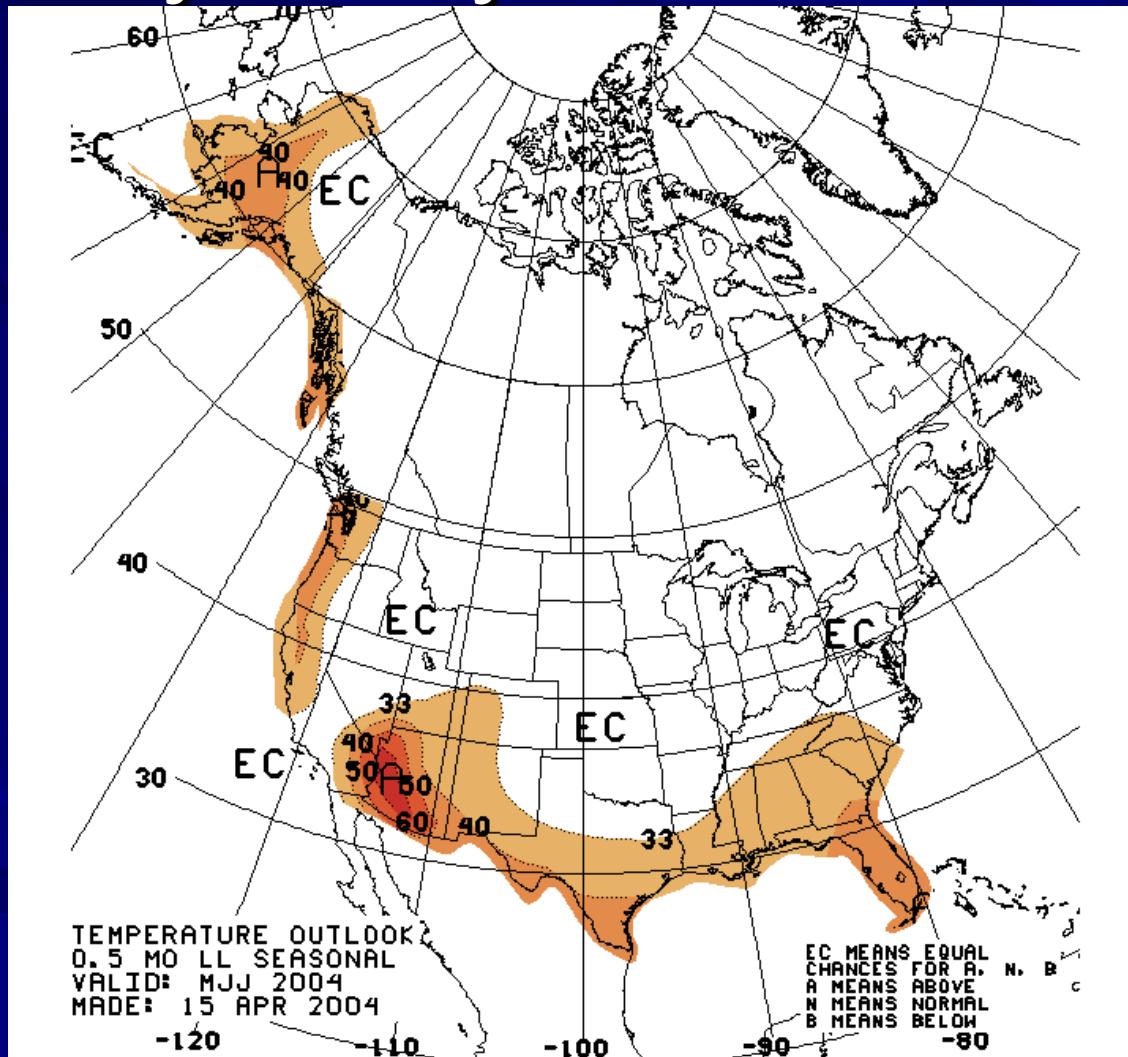
<http://www.cdc.noaa.gov/people/klaus.wolter/MEI/>

El Nino Forecast



<http://www.cdc.noaa.gov/people/klaus.wolter/SWcasts/>

Temperature May – July 2004

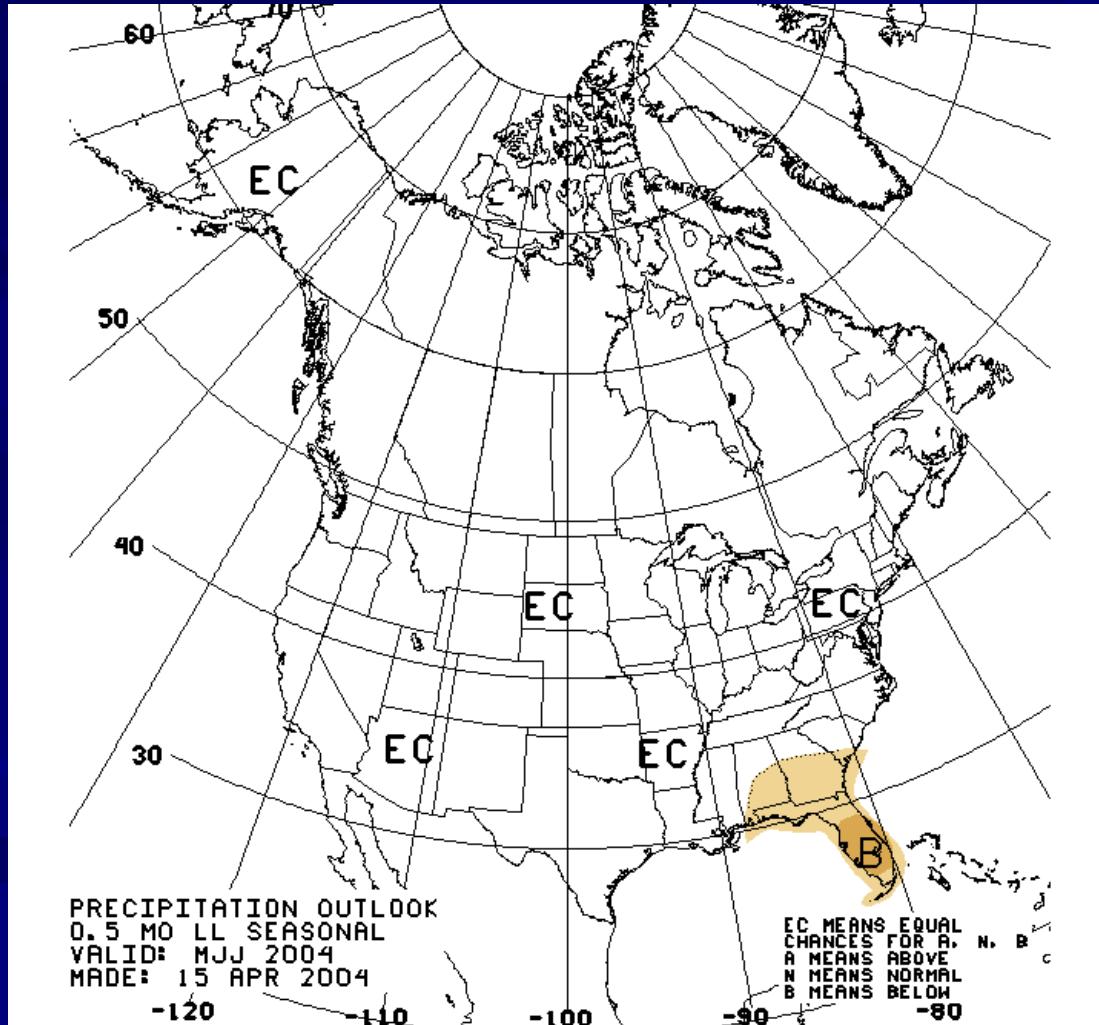


From the Colorado Prediction Center

http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/churchill.html

Precipitation

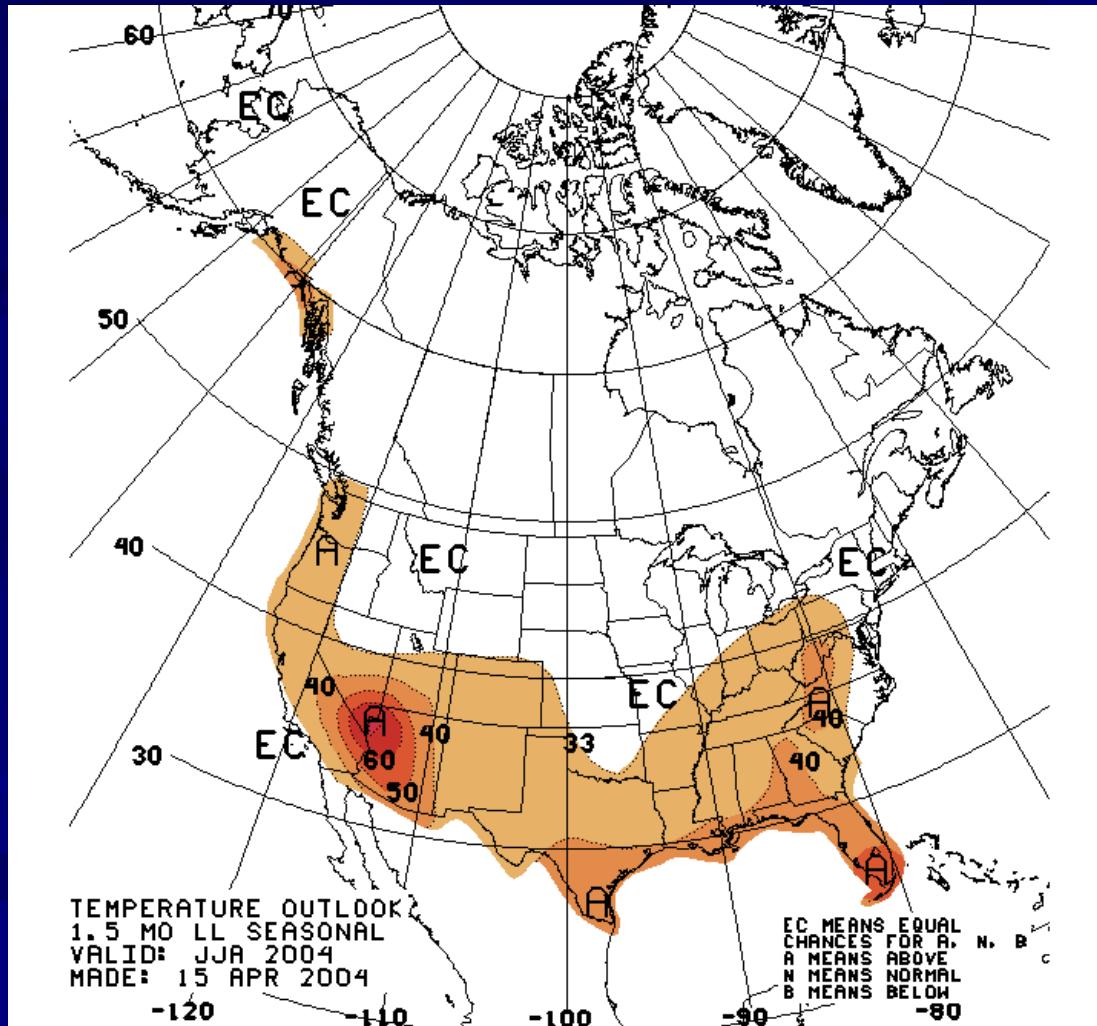
May – July 2004



From the Colorado Prediction Center

http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/churchill.html

Temperature June – August 2004

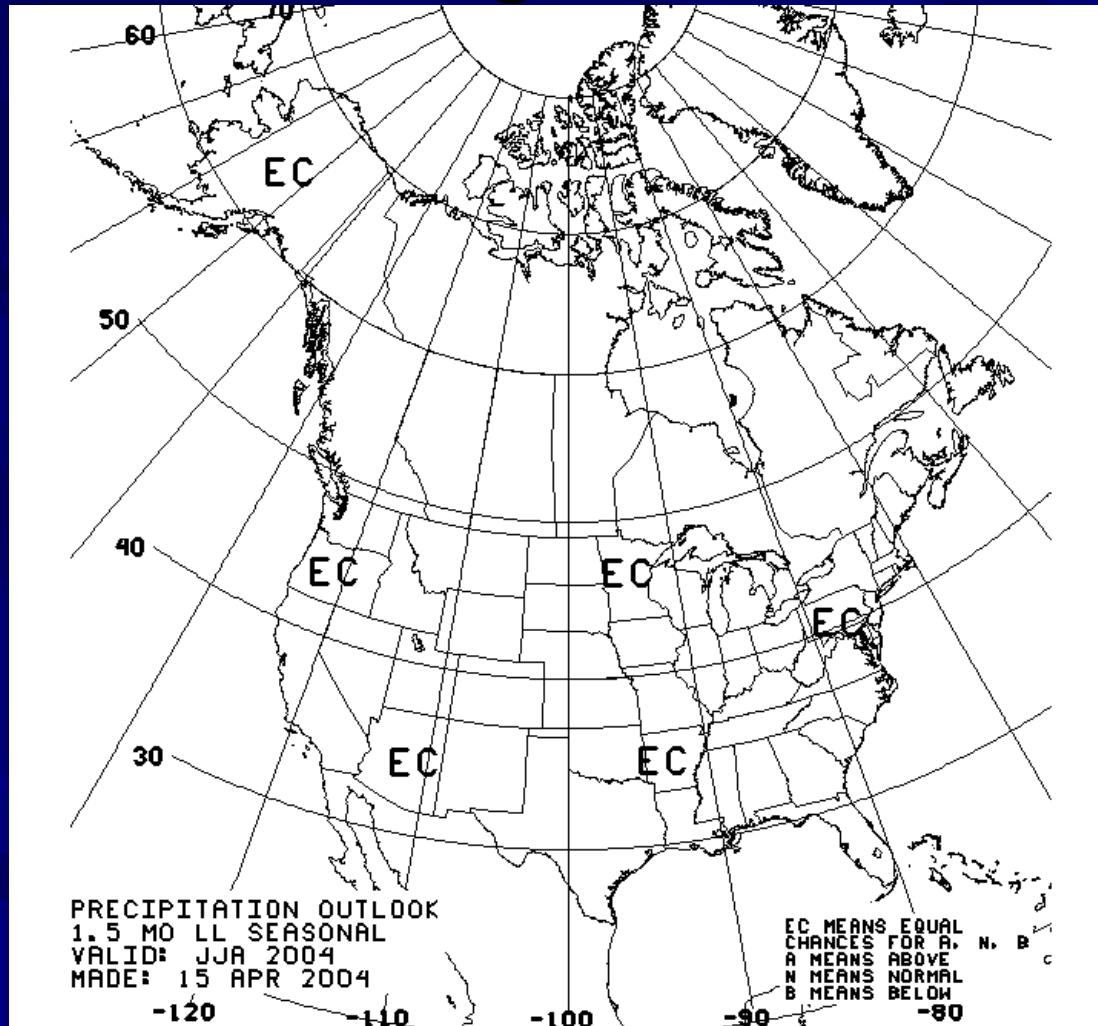


From the Colorado Prediction Center

http://www.cpc.ncep.noaa.gov/products/predictions/multi_seasonal/13_seasonal_outlooks/color/churchill.html

Precipitation

June – August 2004

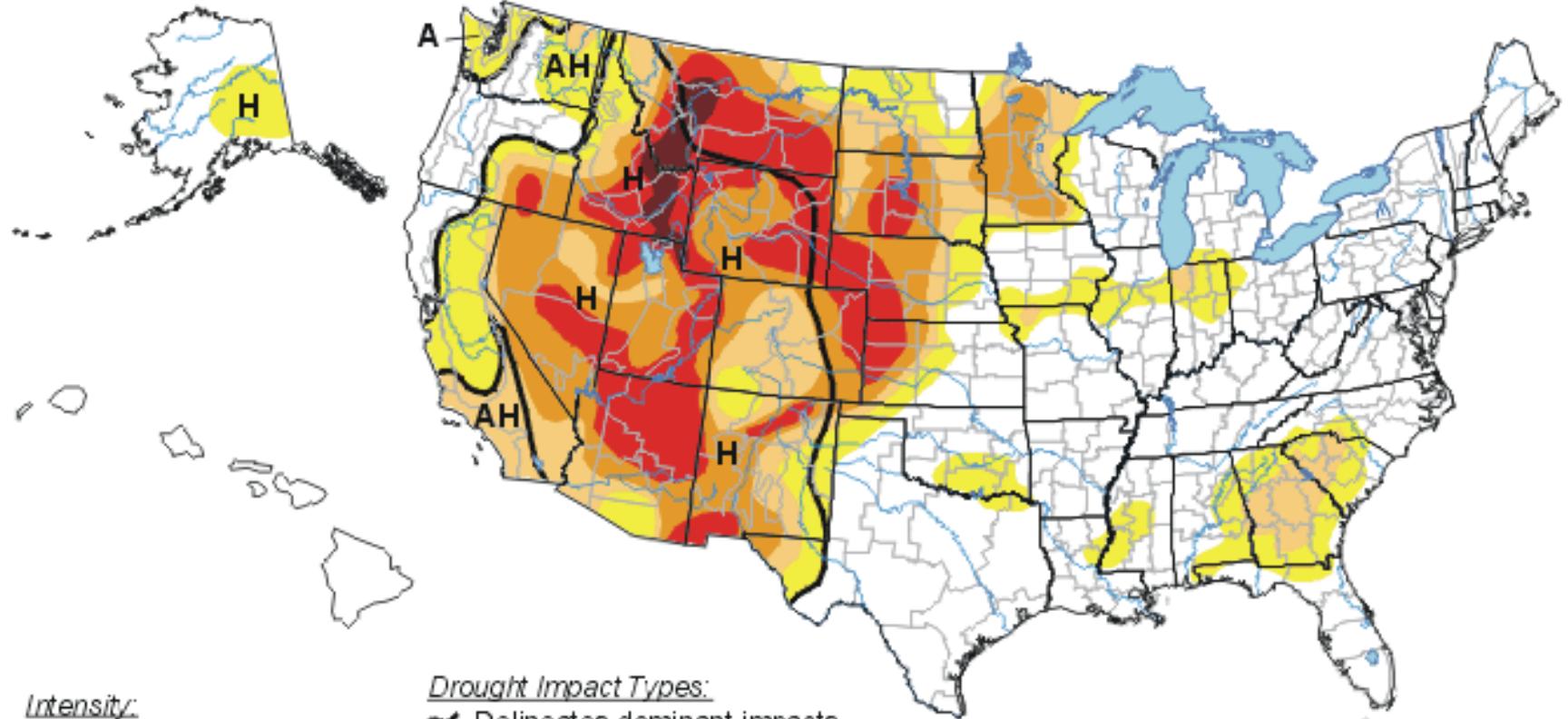


From the Colorado Prediction Center

http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/churchill.html

U.S. Drought Monitor

May 11, 2004
Valid 8 a.m. EDT



Intensity:

- [Yellow] D0 Abnormally Dry
- [Orange] D1 Drought - Moderate
- [Dark Orange] D2 Drought - Severe
- [Red] D3 Drought - Extreme
- [Dark Red] D4 Drought - Exceptional

Drought Impact Types:

- ~ Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)
- A, H = Agricultural and Hydrological
(No type = Both impacts)

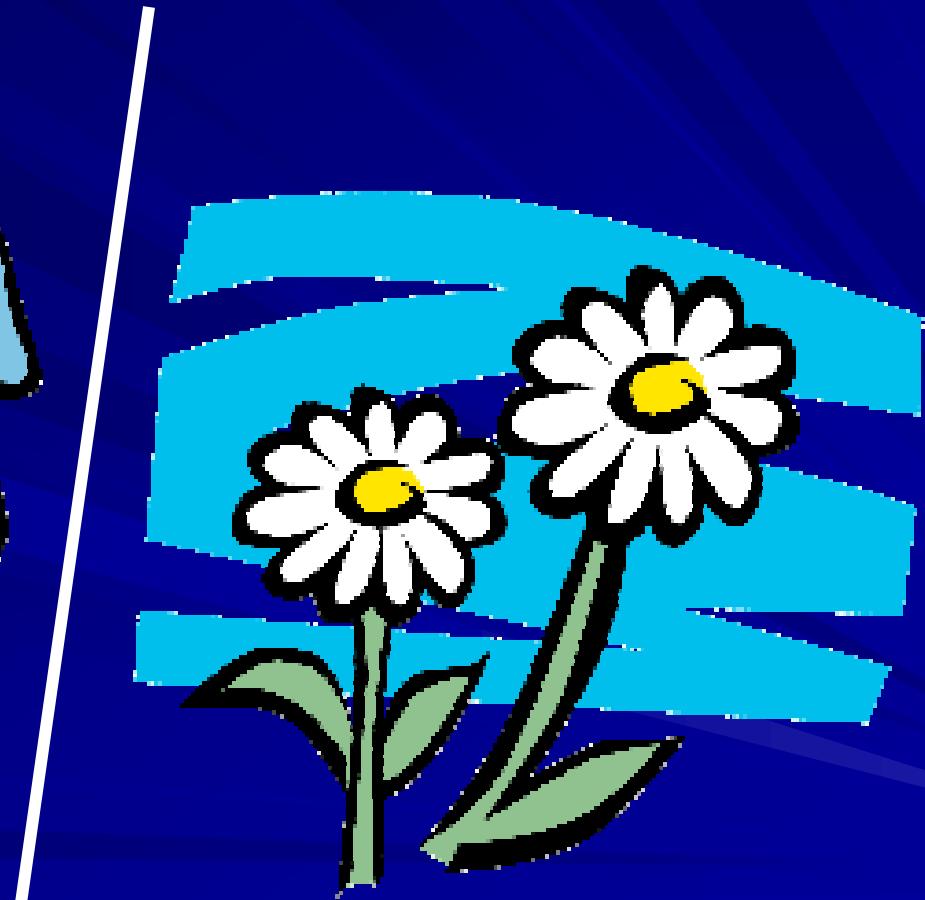
The Drought Monitor focuses on broad-scale conditions.
Local conditions may vary. See accompanying text summary
for forecast statements.

<http://drought.unl.edu/dm>



Released Thursday, May 13, 2004
Author: David Miskus, JAWF/CPC/NOAA

What Can We Do About It?



CoCo RaHS

Community Collaborative
Rain and Hail Study

YOU CAN HELP!

<http://www.cocorahs.org>

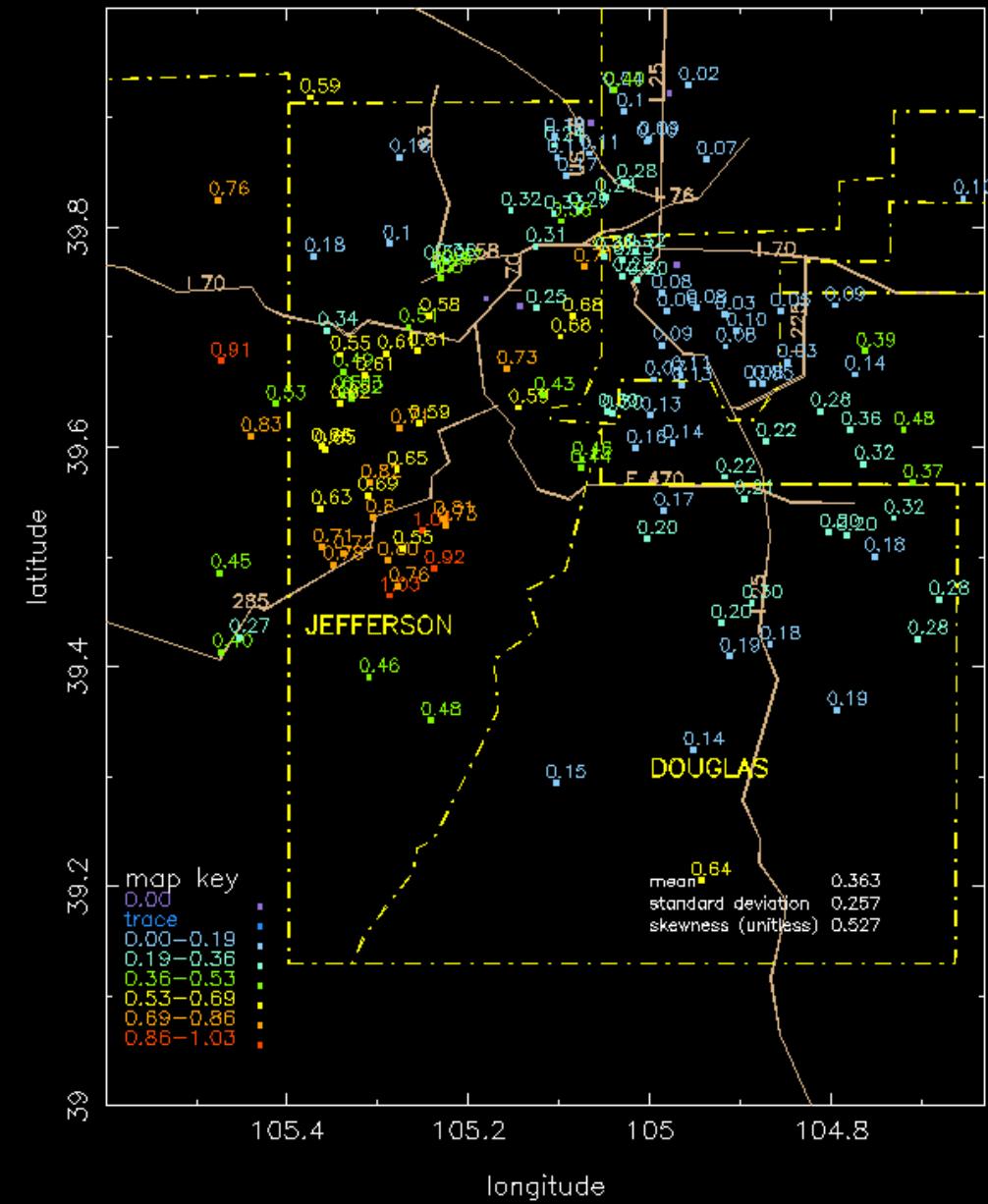


Funding provided by



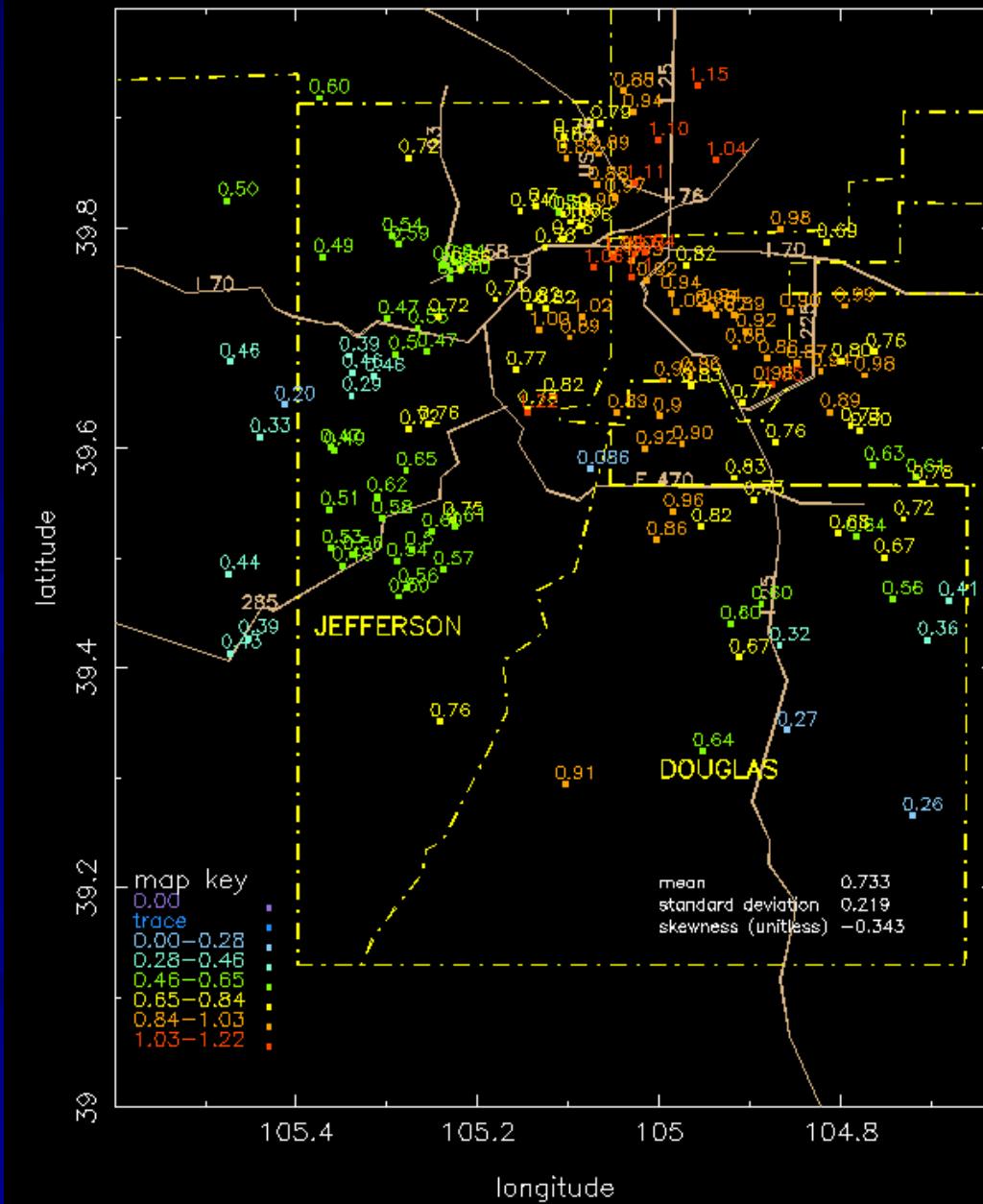
CoCo RaHS Precipitation Map for April 8, 2004

Jefferson & Douglas County Precipitation Map
For the 24 hour period ending ~7:00 am on 04/8/2004



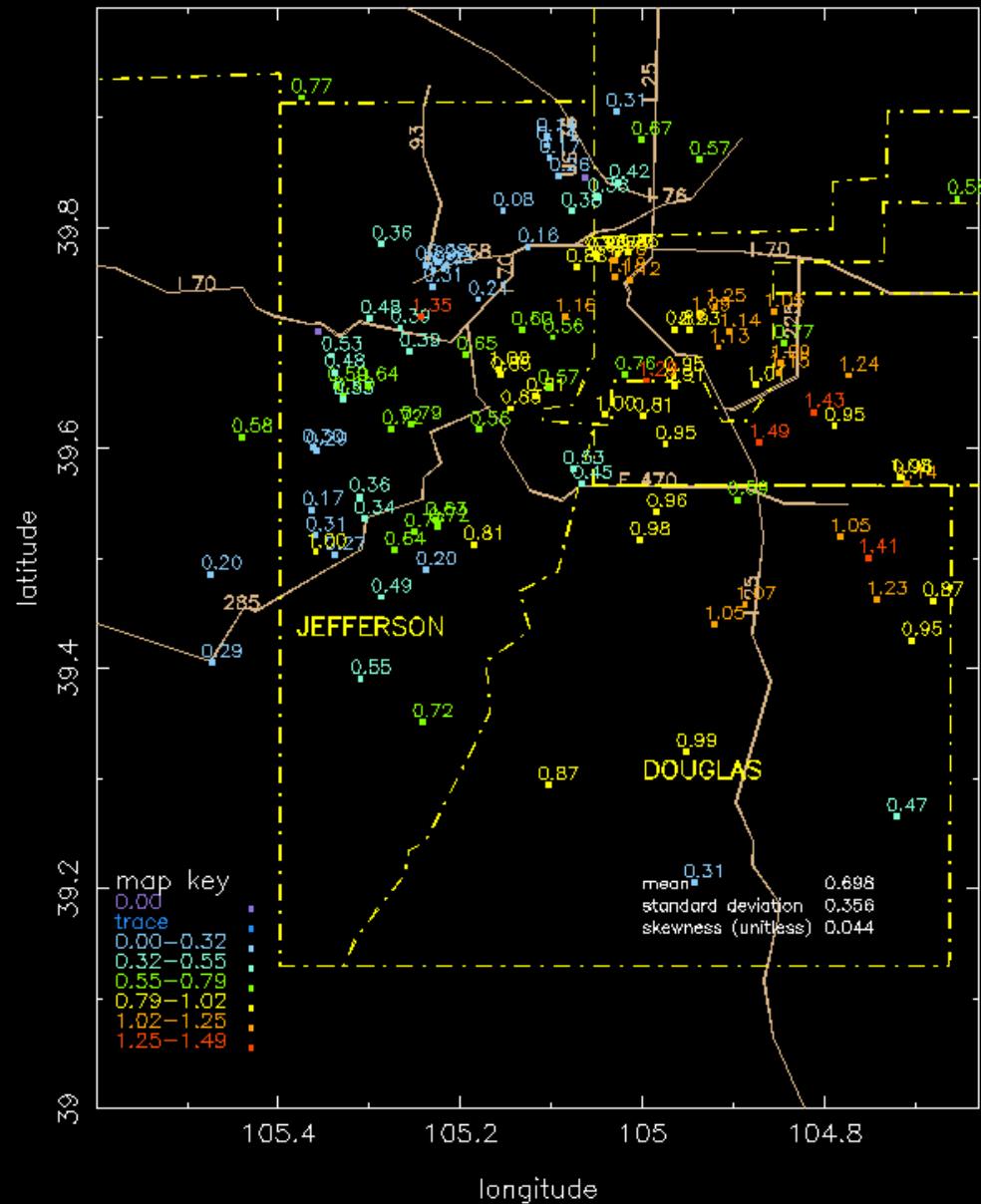
CoCo RaHS Precipitation Map for May 13, 2004

Jefferson & Douglas County Precipitation Map
For the 24 hour period ending ~7:00 am on 05/13/2004



CoCo RaHS Precipitation Map for August 31, 2003

Jefferson & Douglas County Precipitation Map
For the 24 hour period ending ~7:00 am on 08/31/2003



Colorado Climate Center

Colorado State University

■ *Data and Power Point Presentations available for downloading*

■ <http://ccc.atmos.colostate.edu>

click on “Drought”

then click on “Presentations”

